P Med
RE
1
04
v.10
no.7

VOL. X. NEW SERIES. No. 7

JULY, 1901.

Biological & Medical Serials

THE OPHTHALMIC RECORD

EDITED BY

CASEY A. WOOD, M. D. Chicago
EDWARD JACKSON, M. D. Denver, Colo.
G. C. SAVAGE, M. D. Nashville
H. V. WÜRDEMANN, M. D. Milwaukee
GEO. E. DE SCHWEINITZ, M. D. Philadelphia
W. E. HOPKINS, M. D. San Francisco
JOHN E. WEEKS, M. D. New York
HAROLD GIFFORD, M. D. Omaha
FRANK ALLPORT, M. D. Chicago.

T. A. WOODRUFF, M. D.
EDITORIAL SECRETARY,
103 E. ADAMS STREET, CHICAGO, ILLS.

PUBLISHED ON THE FIFTEENTH OF THE MONTH.

SUBSCRIPTION RATES: IN THE UNITED STATES, CANADA AND MEXICO, $4.00 PER ANNUM, IN ADVANCE. OTHER COUNTRIES OF THE POSTAL UNION, 18 SHILLINGS.

THE OPHTHALMIC RECORD.
THE HIGH BUILDING, CHICAGO, U. S. A.

Entered at the Chicago Post-Office as second-class matter F. M. de Rivas & Co., Printers, Chicago

COLLABORATORS.

FRANCIS VALK, M.D., New York.
MELVILLE BLACK, M.D., Denver, Col.
A. W. CALHOUN, M.D., Atlanta, Ga.
WM. DUDLEY HALL, M.D., Boston, Mass.
ALVIN A. HUBBELL, M.D., Buffalo, N. Y.
ROBERT L. RANDOLPH, M.D., Baltimore, Md.
E. OLIVER BELT, M.D., Washington, D. C.,
JOHN F. FULTON, M.D., St. Paul, Minn.
F. B. EATON, M.D., San Francisco, Cal.
E. C. ELLET, M. D., Memphis, Tenn.

CLARENCE A. VEASEY, M. D., PHILADELPHIA.

C. DEVEREUX MARSHALL, F.R.C.S.Eng., London, Eng.

DR. GEORGE J. BULL, Paris, France.

DR. JAMES W. BARRETT, Melbourne, Australia.

The July number of the OPHTHALMIC RECORD will contain amongst others, an original article by H. Gifford, M. D., "A case of Blindness from Drinking Cologne Spirits (Methyl-Alcohol);" one by Don M. Campbell, M. D., "Case Resembling Septic Meningitis and one of Septic Thrombosis of Cavernous Sinus with Exophthalmus and Orbital Cellulitis. Death;" one by William M. Sweet, M. D., "Rupture of the Iris from Contusion of the Eyeball;" one by Lewis H. Taylor, M. D., "The Operation of Couching Performed by a Mule;" one by Carl Weiland, M. D., "The Controversy about the Dioptric Value of the Cornea;" one by Walter R. Parker, M. D., "Treatment of Exophoria." There will also appear Abstracts, Editorials, Society Reports, Personals and Items of Interest to the Profession.

The RECORD particularly desires short practical papers on any subject connected with Ophthalmology. These will be published at as early a date as possible. It is understood that, unless otherwise arranged, original articles when accepted are contributed to the RECORD exclusively. Illustrative cuts will be made at the expense of the journal, and proofs forcorrection will be sent to authors when desired. Reprints with covers are furnished at cost. One hundred of these will be presented to authors *gratis* when a request for them is written on the original manuscript. The RECORD will be issued monthly, and each number will contain about 54 pages of reading matter.

Address all communications relating to Editorial Department to

T. A. WOODRUFF, M.D., Editorial Secretary,
103 E. Adams Street, Chicago.

Subscriptions and advertisements should be sent to the publisher, The High Bldg., Chicago, Ill., U. S. A.

Sole Subscription Agents for Great Britain, J. RAPHAEL & Co., 51 Clerkenwell Road, London, E. C.

TABLE OF CONTENTS.

I. ORIGINAL ARTICLES.

1. Case resembling septic meningitis and one of septic thrombosis of cavernous sinus with exophthalmus and orbital cellulitis. Death. *By* **Don M. Campbell, M, D.,** *Detroit, Mich.* ... 337
2. A Case of blindness from drinking cologne spirits (Methyl Alcohol), *by* **H. Gifford, M. D.,** *Omaha, Neb.* ... 342
3. Rupture of the iris from contusion of the eyeball, *by* **William M. Sweet, M. D.,** *Philadelphia. (Illustrated.)* ... 345
4. The operation of couching performed by a mule, *by* **Lewis H. Taylor, M. D.,** *Wilkesbarre, Pa.* ... 347
5. A case of conjunctival tuberculosis, with peculiar onset, ending in spontaneous healing. Report of a case from the University eye hospital, Rostock, Germany, *by* **A. Levy, M. D.,** *Montreal, Can.* ... 349
6. The controversy about the dioptric value of the cornea, *by* **Carl Weiland, M. D.,** *Philadelphia, Pa.* ... 356
7. Treatment of Exophoria, *by* **Walter R. Parker, M. D.,** *Detroit, Mich.* ... 359

II. ABSTRACTS.

1. Retinal Changes in Chronic Anaemia. ... 363
2. New Prothesis for the Orbits of Children. ... 363
3. The Central Black Spot in Myopia. ... 364
4. The Prognosis and Therapy of Traumatic Luxation of the Lens. ... 365
5. Concerning the treatment of the ocular complications of small-pox, 366
6. Hepatic Organo-Therapy in the treatment of essential Hemarolopia ... 367
7. Prognosis and Therapy of Perforating infected Wounds of the Eyeball. ... 367
8. Concerning the modified open wound treatment after operation upon the eyeball ... 368
9. New eye remedies in 1900. ... 368
10. Concerning the Neuroglia in Optic Neuritis ... 370

III. EDITORIALS.

1. The recognition abroad of American work in opthalmology ... 372

IV. TRANSLATION.

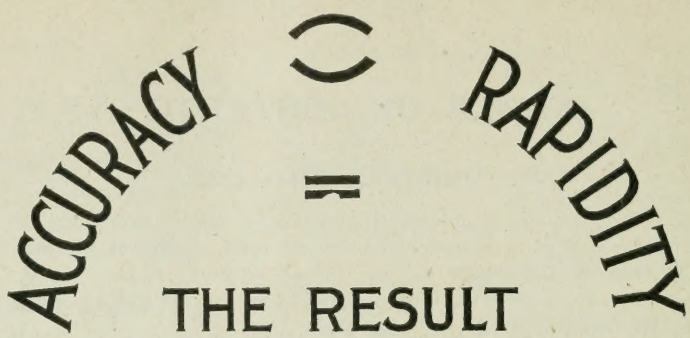
1. Action of certain toxines upon the cornea. ... 374
2. In what ways can the toxines secreted in the conjunctival sac act upon the cornea? ... 374
3. What is the special action of each toxine? ... 376

V. REPORTS OF SOCIETIES.

1. Ophthalmological Society of the United Kingdom. ... 380
2. Chicago Ophthalmological and Otological Society. ... 382

VI. NEWS ITEMS.

1. Personals and Items of Interest to the Profession ... 388



THE RESULT

That Makes Our ℞ Department the Largest in the World.

Each ℞

Is individualized as soon as it is received and is put in a separate box and receives the special treatment that the particular ℞ calls for, and from start to finish the work is done by the most competent workmen, and is carefully inspected before mailing.

We have made

a study of ways of getting work back to our customers at the earliest possible moment after it is received by us, and have no hesitation in saying that we give the promptest service given by any house in the country.

Our charges

for ℞ work are as low as those made by any house in the country, and the grade of work we turn out is the very best that can be done.

LET US SEND YOU OUR CATALOGUE AND ℞ BOOK.

F. A. HARDY AND COMPANY

WHOLESALE AND MANUFACTURING OPTICIANS.

The Prudential Bldg., ATLANTA, GA.

THE SILVERSMITHS BLDG., CHICAGO, ILL.

1606 Curtis St, DENVER, COL.

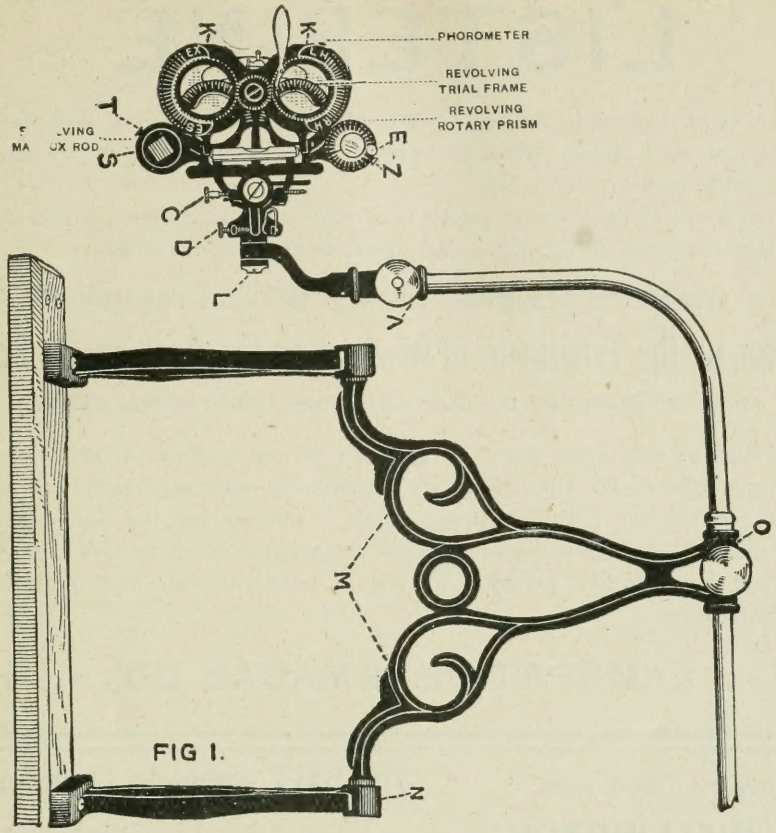


FIG 1.

THE LATEST OPTOMETER

COMBINES

A REVOLVING CELL TRIAL FRAME,
" " RISLEY ROTARY PRISM,
" " MADDOX ROD,
AN IMPROVED STEVEN'S PHOROMETER.

Anyone of them can be used independently of any other or in conjunction with each other.

There is no muscular tests resorted to to-day that are not within the scope of this instrument.

Send for descriptive pamphlet.

Manufactured by

WM. F. REIMOLD,

MANUFACTURING OPTICIAN,

41 North 13th Street, - - - PHILADELPHIA, PA.

LISTERINE

The word Listerine assures to the Medical Profession a non-poisonous antiseptic of well-proven efficacy; uniform and definite in preparation, and having a wide field of usefulness.

On account of its absolute safety, Listerine is well adapted to internal use and to the treatment of Catarrhal Conditions of the mucous surfaces.

LITERATURE DESCRIBING THE BEST METHODS FOR USING

Listerine in the Treatment of Diseases of the Respiratory System

WILL BE MAILED TO YOUR ADDRESS, UPON APPLICATION.

We beg to announce that, in addition to the 14 oz. bottle, in which Listerine is offered to the trade, the pharmacist can now supply a smaller package, containing 3 fluid ounces, which is put up for the convenience of practitioners who prefer, upon certain occasions, to prescribe articles of established merit in the Original Package, under the seal and guarantee of the manufacturer.

LAMBERT PHARMACAL CO., ST. LOUIS.

Patented Nov. 23rd, 1897.

THE WELLINGTON SPECIALIST'S CHAIR.

IT LOOKS AND IS PROFESSIONAL.

The ONLY complete Chair on the market for Specialists' use.

By its use you can obtain any position necessary in examining the eye, ear, nose or throat.

It does away with the awkward positions so often unavoidable in making these examinations by other methods.

The seats can be raised or lowered to any height required.

The patients seat is provided with a back. The head rest can be raised or lowered as required.

The patient may be turned to right or left.

The arm can be removed if necessary to obtain required positions.

There is a swinging bracket for instruments.

It is made of quartered oak or imitation mahogany beautifully finished.

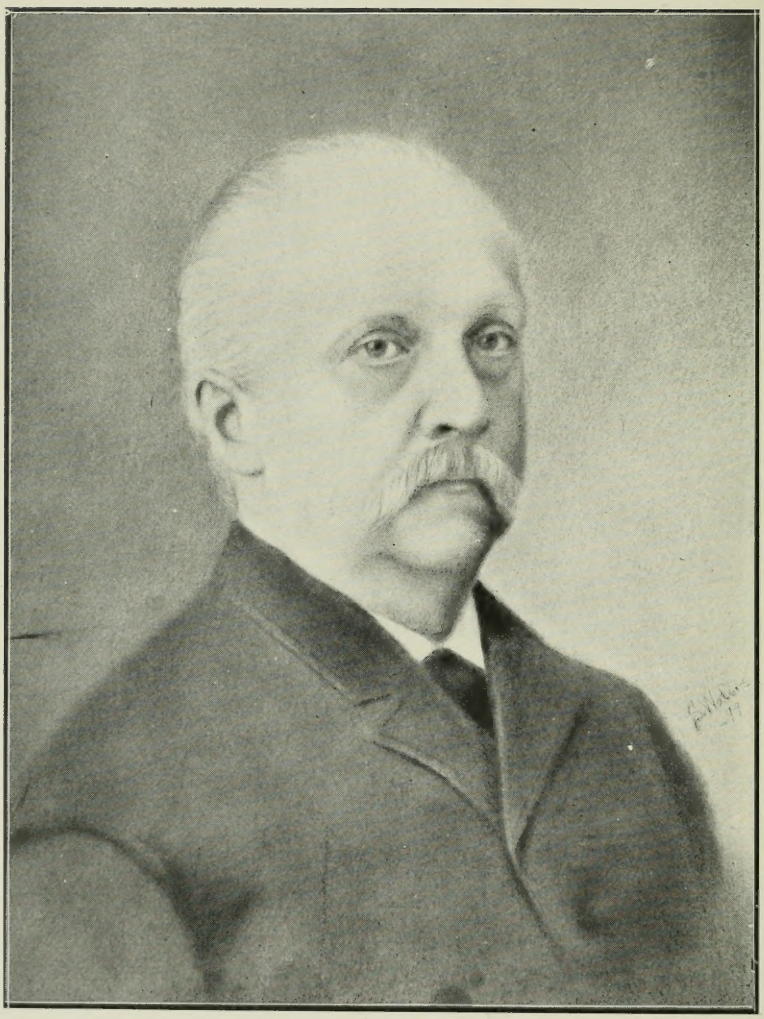
Especial chairs may be ordered. We have given our chair years of careful thought and have spared **no pains** to make it complete in every detail, we submit it for your approval.

Write for information, terms, etc., to

THE WELLINGTON CHAIR CO.

CHICAGO, ILL.

In writing please mention the Ophthalmic Record.



Prof. H. Von Helmholtz.

THE

OPHTHALMIC RECORD

A MONTHLY REVIEW OF THE PROGRESS OF OPHTHALMOLOGY.

VOLUME X. CHICAGO, JULY, 1901. No. 7. NEW SERIES

ORIGINAL ARTICLES.

CASE RESEMBLING SEPTIC MENINGITIS AND ONE OF SEPTIC THROMBOSIS OF CAVERNOUS SINUS WITH EXOPHTHALMUS AND ORBITAL CELLULITIS. DEATH.

By DON M. CAMPBELL, M. D., L. R. C. S. (Edin.)

Clinical Professor of Ophthalmology and Otology and Lecturer on the Eye and Ear in the Detroit College of Medicine—Ophthalmologist and Otologist to Harper Hospital.

DETROIT, MICH.

The two cases which I herewith report, and which form the basis of this short paper, are chiefly interesting, not from the rarity of their clinical histories, but rather from the rapidly fatal course which they each pursued, termination by death being, to say the least, an unusual spectacle in ophthalmic practice.

On Monday, February 12, 1900, I was asked by Dr. Belanger, of River Rouge, to see a case with him in consultation at my earliest opportunity, which I did, examining the case with him at 9 o'clock that evening.

The clinical history of the case was very brief, but exceedingly interesting.

The Thursday night before the child, a girl of 12 years, had been in such good health that she had taken part in a musical programme at the village church, for which occasion she had blackened her face.

All day Friday she was in her usual health and spirits, but on Saturday morning it was noticed that there was a small pimple on her forehead over the right frontal eminence, but little notice being taken of it, however, until Sunday morning, when it seemed to be ready to

rupture and discharge its contents. The child broke the pustule with her finger and a small bead of pus was evacuated.

She felt in her usual health until late in the afternoon, when she had a slight chill, followed during Sunday night by fever and restlessness.

Monday morning Dr. Belanger was called in incidentally, the parents being not at all alarmed; but upon making a thorough examination the doctor found the following conditions: Mentally the patient was perfectly clear, but she was very restless, complaining of great pain in her head. No appetite; some nausea; no vomiting; no pain or discomfort in any other part of the body, and a thorough physical examination failed to reveal any pathologic condition elsewhere. Temperature, 104 degrees F.; pulse, 140, small and very weak. The right eyelids were puffy and oedematous, and the eyeball perceptibly exophthalmic.

The pustule was freely open, and there was some oedema in its vicinity, but no erysipelatous flush to the skin.

The doctor, becoming anxious at the above constellation of alarming symptoms, ordered thorough disinfection of the local lesion, hot bichloride packs and a mercurial purge.

Returning at 4 p. m. for a second examination, he found the temperature 106 degrees F., pulse 160, and the patient delirious. The exophthalmus was more marked and the eyeball much more oedematous.

When we saw the patient together at 9 p. m. the temperature (axillary) was 105 degrees F., the pulse could not be counted and she was deeply comatose with widely dilated and immobile pupils, enormous exophthalmus, great puffiness of the lids and some puffiness on the left side.

The mastoid regions were entirely free from all oedema.

An unfavorable prognosis was given and immediate operation for the evacuation of any pus which might be in the orbital cavity was undertaken.

The child being deeply comatose an anaesthetic, other than cocaine, was deemed unnecessary. Several very free incisions were made deep into the orbital cavity around and behind the eye, but they failed to reach the least trace of pus.

The comatose condition continued and the child died at one o'clock on Tuesday, less than 48 hours after the initial chill which ushered in the alarming symptoms.

Some months ago there was admitted to Harper Hospital during

my service a patient who, upon examination, showed a well-marked double phlegmonous orbital cellulitis with not the least erysipelatous involvement of the facial integument.

The clinical history showed that the patient was a weak-minded, under par individual, upon whose cheek there had two weeks previously appeared a small pustule.

The left orbital cavity became involved first, being followed by a similar septic process in the right four or five days subsequently.

The patient's mental condition was very cloudy, although he could by considerable persistency be aroused enough to feebly answer questions.

Each eye was enormously exophthalmic, and distinct evidences of pus could be made out behind and around each eye.

The temperature showed the characteristic curve of septic infection, now up to 104 degrees or 105 degrees F., and again down to subnormal, chills and sweats also being present.

Many free incisions were made through the lids and around the eyes, deep into the orbital cavities, great quantities of pus and necrotic tissue being evacuated.

In spite of the free drainage given, and in the face of all that could be done in the way of constitutional treatment, this patient also died comatose eight days after admission to the hospital, showing all the evidences of general septic infection and also a pneumonia, which was looked upon as metastatic in character.

In the clinical histories of these two cases there are points of great similarity, and yet a close inspection of each clinical course shows also great divergences.

The etiology and the early involvement of the orbital cavity in each from a similar facial lesion are strikingly alike, and yet as soon as the intra-cranial cavity is involved a great divergence of clinical phenomena become apparent.

In the case first described a continuously high temperature and rapid weak pulse, terminating early in coma and death, point, it seems to the writer, to a septic meningitis with rapid effusion, which latter accounts for the pressure symptoms and the early fatal termination, whereas the second case, with its rapidly vacillating temperature and pulse, its chills, sweats and early involvement of the second orbital cavity, presents a group of clinical symptoms widely different from those found in the first case, but, nevertheless, unmistakably pointing

to septic thrombosis of the cavernous sinus and death from general sepsis, which opinion is strengthened by the appearance of the septic pneumonia a day or two before death and also by the appearance of oedematous swelling in the mastoid region.

All treatment, medical and surgical, was unavailing in each case.

In such cases can we do more, surgically or medically, than is now the most advanced plan of treatment? This, in view of the fatal termination in such cases, becomes a pertinent question.

Would an early enucleation of the eye secure a better drainage? Can the cranial cavity be entered and drained through the orbital cavity?

In view of the advanced and brilliant work done in aural intracranial surgery, these become very interesting and important questions which await a master mind and daring hand for their solution.

I believe that better drainage, together with an early bacteriologic examination and the prompt and heroic employment of a suitable antitoxic serum would be productive of good in this now hopeless class of case.

In my cases my earnest efforts at securing reliable bacteriologic data were unfortunately frustrated, so I have nothing to offer from that important standpoint. Nevertheless, it would be extremely interesting to know what kind of an infection produced such a rapidly fatal result, especially in the first case. Was it an ordinary streptococcus infection? Was it malignant pustule?

Only by future carefully conducted bacteriologic investigation can similar questions be answered in future cases, and certainly the practically good influence on treatment would be hailed with pleasure by any one who has felt the inadequacy of present methods in handling such unfortunate cases.

Fortunately, many cases of orbital cellulitis, or phlebitis, do not run the critical course which these two pursued, but go on to resolution without involving the intra-cranial cavity, although the thrombotic process, once started in the orbital veins, is very likely to extend to the cavernous, especially in distinctly septic cases.

In addition to the class of cases examplified by the foregoing histories, there are many other forms of orbital cellulitis classified according to their etiologic factor, such as those arising from penetrating wounds of the orbital cavity, with or without injury to the eyeball, the foreign body carrying with it the germ of infection; if, however, the

missile be sterile, it may frequently remain in the cavity without further trouble for many months.

Somewhat in the same class might be mentioned those cases following operative intervention, involving cleanly and aseptic procedures of modern surgery. This is now a rare complication.

A septic process may extend from a similar disease affecting contiguous structures. Inflammatory action in the ethmoid cells, frontal sinus, or antrum of Highmore may extend into the orbit. The lachrymal gland may, in rare cases, suppurate and infect the orbital contents, or facial erysipelas may have as one of its more serious complications an orbital cellulitis.

Metastasis in such diseases as typhus fever, scarlet fever and purulent meningitis is responsible for some cases of orbital cellulitis, and I have seen one such complication occurring in the course of puerperal pyaemia.

57 West Fort Street.

Kenneth Scott does not believe that flies play an important part in transmitting conjunctivitis in hot countries. In Egypt the natives use for "sore eyes" pastes containing sugar, alum, cayenne pepper, etc., thus favoring ulcerations, etc.

At the New York Ophthalmic and Aural Institute (Knapps), during the past year, 547 new patients were treated in the hospital and 12,381 patients in the dispensary; 1,159 important operations were performed, of which 122 were cataract extractions.

The Effect of Shock on Chronic Glaucoma.—H. Carter Mactier reports the case of a man aged sixty-one years, who for some time had been suffering from chronic glaucoma, but could see enough to do his work. One day he was accidentally thrown into a canal basin, injuring his knee; when removed from the water he was quite unable to see. For a few weeks vision improved, but never attained the sharpness present before the accident. Except for the slight improvement mentioned, he has grown steadily worse. This injury to vision was undoubtedly caused by the shock he sustained.—*British Medical Journal.*

A CASE OF BLINDNESS FROM DRINKING COLOGNE SPIRITS (METHYL ALCOHOL).*

By H. GIFFORD, M. D.

OMAHA, NEB.

Two years ago I reported one case of blindness and several cases of death from drinking methyl alcohol (Oph. Record, Sept., 1899); and I have recently had another case of blindness from the same cause which is of decided interest.

W. B. S., aged about 35, was brought to me Nov. 28, 1900, with the history that his sight had begun to fail two days before, and that blindness had been complete for several hours. The patient was a man in apparently perfect health except for his eyes. The right eye was absolutely normal, objectively, except for a dilated pupil, which gave no sign of contraction on light stimulus. Vision = 0. The left eye had a shrunken cataract and had been entirely blind for many years. The patient could think of nothing to account for his blindness except that he had not been feeling well for a few days preceding its onset. Thinking it to be one of the rare but well-recognized cases of idiopathic retro-bulbar neuritis, I gave a not altogether hopeless prognosis and started the patient on a pilocarpine sweat cure with large doses of iodide of potassium. After about four days light perception began to return at the periphery of the field, and the vision slowly but steadily increased until, after two months, it was nearly 20-20, although the optic disc had in the meanwhile become distinctly atrophic and the retinal vessels in their course over it were bordered by well-marked connective tissue sheaths. The field also showed a marked contraction of the lower temporal quadrant, the outer limit in this direction being 40 degrees.

The episode might easily have been closed without my learning anything more of the etiology of the trouble if something about the manner in which the man's sight returned had not suggested to me, about two weeks after I first saw him, that there might have been some methyl alcohol in the case. On my questioning him, he at first was sure that he had never drunk anything of the kind; but on being further pressed as to his having taken anything that might possibly

*Read before the Missouri Valley Medical Association, March 21, 1901.

have contained methyl alcohol, he remembered having drunk some cologne spirits, of which he had received a fresh consignment for use in his profession a few days before his sight began to fail. A sample from the same jug was immediately sent for and proved to be nearly pure methyl alcohol, apparently flavored with something to take away its characteristic smell. In the light of this discovery the patient then went over his history again and gave the following facts: On Friday, Nov. 23rd, he received this jug, and, as he lived in a temperance town, where good whiskey was hard to obtain, he took two or three drinks from it. That evening he felt sick at his stomach, but attributed this to an oyster stew which he had eaten. He may have taken another drink next day, but is not sure about this. He felt out of sorts on the 24th and 25th, and his sight began to fail on the morning of the 26th. This history, with the fact that the cologne spirits had turned out to be methyl alcohol, made the diagnosis plain enough.

At the time that I first made out the real nature of the case the patient's vision had improved considerably, so that he was able to count fingers and find his way about. But the discovery that the trouble was due to methyl alcohol made me more doubtful about the final outcome of the case than I otherwise should have been, because, with one exception, in all the previously reported cases of this sort of blindness the improvement in the vision which followed the total blindness proved to be transitory and delusive, the final result being total, or nearly total, blindness.[1] The exception referred to is the case of Kuhnt, in which nearly normal vision was regained, as in this last case of mine.

This case deserves reporting as a warning to consider the possibility of methyl alcohol poisoning in all obscure cases of sudden blindness. My patient hadn't the slightest idea of connecting his blindness with the cologne spirits which he had drunk; and if the thought had not accidentally occurred to me, he probably, on recovering sufficient sight to go home, would have again resorted to the cologne spirits jug, with the result of producing permanent blindness, or, more probably, death; and there is no telling how many of his boon companions might have partaken of the deadly stuff. In my former paper on this subject, I urged that legislation should provide for the marking of all packages of methyl alcohol, "Poison," and the

1 In the cases of Patillo and Wood, enough sight to count fingers at two and eight feet was retained.

fact that a reputable wholesale firm can substitute it for cologne spirits shows how important it is that its dangerous properties should be more widely understood.

This case is also of interest from the testimony which it gives as to the seat of the main lesion in methyl alcohol amblyopia. The experimental results obtained by Holden, which have been confirmed by Birch-Hirschfeld, indicate that in some of the lower animals, at least, it is the ganglion layer of the retina rather than the optic nerve which is primarily affected. But as I have urged before, the clinical symptoms in man speak rather for a primary lesion of the optic nerve, perhaps in combination with some disturbance in the retina; and this case seems to bear out the contention. I studied the fundus carefully several hours after the blindness became complete, and a number of times thereafter, and not the slightest indication of the haziness of the retina, which would be expected from a marked interference with the nutrition of the ganglion layer, was observed at any time. Three or four weeks after the beginning of the blindness, I noticed a few very fine yellowish spots in the region of the macula, which I had not noted before, although they may have existed. They were nothing more than is frequently observed in normal eyes. On the other hand, the perfectly normal appearance of the nerve and retina at the time when the blindness was complete and the atrophy of the optic disc which occurred later on (good vision having been regained meanwhile), speak decidedly for a primary retro-bulbar lesion of the optic nerve.

I take this opportunity of mentioning a peculiar condition which developed in one eye of my first methyl alcohol patient. I saw him again about a year after he went blind, and found that in the left optic disc, which at the preceding examination did not differ from the right one, a number of fine, jet-black specks had appeared, chiefly along the vessels in the lower outer quadrant. I have never seen anything like it except in the eyes of rabbits, etc., into whose vitreous chambers I had injected India ink, for experimental purposes. I can think of no very plausible explanation of the phenomenon.

RUPTURE OF THE IRIS FROM CONTUSION OF THE EYEBALL.*

By WILLIAM M. SWEET, M. D.
PHILADELPHIA.
(ILLUSTRATED.)

Rupture of the iris at the pupillary border is probably a common occurrence in contusion injuries of the eyeball when there is a permanent mydriasis, a fact to which Hirschberg has called attention. Many cases of paralytic mydriasis are probably instances of rupture of the pupillary margin of the iris, although a true paralytic form of mydriasis does occur. Harlan[1] has reported two cases of this character, explaining the condition as a kind of peripheral stunning of the nerve fibres which affects the accommodation equally with the pupil.

In contusion injuries of the eyeball the force of the blow, when not sufficient to rupture the globe, may expend itself on the internal structures, either as a rupture of the iris or choroid, dislocation of the lens, or hemorrhage from the vessels. In injuries of the iris Harlan regards the pupillary rupture as next in frequency to separation of the iris at the ciliary border, the rarest form of injury being rupture of the iris in its continuity, especially the radiating form of tear. Of the three cases here appended, two showed rupture both at the pupillary border and in the continuity of the iris, while in one the tear was at the pupillary margin alone.

Case I.—Chas. H., aged 58, while taking apart a heavy bedstead, in November, 1898, was struck across the left eye by one of the posts. A scar at the inner portion of the superior orbital border and the tenderness over the malar prominence showed that the object struck at an angle of about 135 degrees. The swelling of the soft parts was sufficient to prevent the opening of the lids for nearly a week, home remedies being used to relieve the pain and swelling. I saw him four weeks after the accident. The pupil was then dilated and fixed, with one large rupture at the pupillary margin of the iris extending downwards and outwards, five small tears at the pupillary border and two radial ruptures in the continuity of the membrane at its lower portion. The pupil measured 5½ mm. in the shortest diameter and 7½ at 135°. The notch of the posterior border was crossed at its apex by several fine thread-like fibres of iris tissue. A watercolor sketch made by Xanthus Smith

* Read before the Section on Ophthalmology, College of Physicians, Philadelphia, March, 1901.

[1] Report American Ophthalmological Society, Vol. VII.

shows the large pupillary rupture and the radial slits in the iris as they appeared when viewed with oblique illumination. The lens was dislocated, lying upon the floor of the vitreous chamber. Under eserin the iris contracted about 1 mm., but after the effects of the myotic had disappeared returned to its former dimensions. There was no injury of the retina or choroid and vision with +9 glass equaled $\frac{20}{40}$—.

Case II.—Tony D., aged 32, was struck in the left eye by a piece of stone while quarrying in July, 1898, and came to the Out-Patient Department of the Jefferson Hospital, in the service of Dr. Hansell. Examination made about three hours after the accident showed a slight wound near the center of the upper lid and a slight abrasion of the cornea immediately beneath the cut on the lid. The pupil was slightly oval and dilated, the long axis measuring 7 mm. at an axis of 105 degrees and 6 mm. in the shortest diameter. A small blood clot adhered to the iris in the upper inner portion at a point nearly midway between the pupillary border and ciliary attachment. By oblique illumination several small tears could be seen in the pupillary border of the iris. A drop of eserin was instilled and, when examined several minutes later, the pupil was contracted slightly and the blood clot had fallen to the lower portion of the anterior chamber, exposing a narrow slit in the iris in the upper inner portion about 2 mm. in length. The action of the eserin caused a slight gaping of the wound. The accommodation of the eye was not affected. Atropia was instilled, which probably caused healing of the cut in the iris, as the patient did not return to the clinic.

Case III.—Patrick G., aged 35, was seen three months after having been struck in the right eye by a large piece of a brick. The man was illiterate, and it was difficult to obtain any details of the injury. There was a large rupture of the iris at the temporal portion of the pupillary border, with the iris tremulous on this side and to the nasal half. There were also a number of small tears in the pupillary border of the iris which could be seen with oblique illumination. The lens was slightly tilted backwards at its temporal margin. The vitreous was filled with opacities and no view of the fundus was possible. The man never returned after the first examination.

In only one of the cases could the accommodation be taken, and here the near point was the same for both the good and injured eye. The first case, with dislocated lens and radial ruptures, showed no change in the condition of the mydriasis or pupillary ruptures one and a half years after the injury.

THE OPERATION OF COUCHING PERFORMED BY A MULE.

By LEWIS H. TAYLOR, M. D.
WILKES BARRE, PA.

Mr. George D., aged 55, was brought by his physician to my office on Feb. 9, 1900, with the history of having been kicked by a mule in the back and side of his head. He was knocked against a car, striking the supra orbital ridge and side of his face. He was seen in my absence by Dr. Buckman, who made the following note: "Patient has had a great deal of pain; the eye is inflamed; the iris was immovable, but is now partly dilated with atropia. Vision in R. merely counts fingers. L. = $\frac{20}{40}$. With Oph. cannot get a clear view, owing to difficulty in opening the eye. There is red reflex, though not clear, but no decided obscurity. Cornea is rough and iris tremulous. Lens probably dislocated into the vitreous, though I cannot find it. Atropia seems to cause pain, so will change to eserine (gr. $\frac{1}{2}$ to ʒ i) every four hours. Continue Ac. Boracic wash, which he is already using. Leeches to be applied to-morrow."

Dr. Buckman again saw him on Feb. 19, and made the following note: "Eye is improving. Very little pain now and inflammation subsiding. Further there is no change. Pupil does not contract. Ophthalmoscopic appearance is limited to red reflex. Iris tremulous and general internal appearance the same as ten days ago. Now use eserine (gr. ii to ʒ i)."

I first saw the patient on May 11, three months after his injury. By this time all inflammation had subsided, the media clear, and with the ophthalmoscope the lens could be plainly seen lying in the lower part of the vitreous chamber. A complete and successful case of couching. With + 7 before the Oph. the nerve could be plainly seen. No evidence of injury present except the dislocation of lens. Patient can count fingers, and vision is about $\frac{2}{200}$. With + 11 ⊃ + .75cy. ax 15°, V. = $\frac{20}{40}$? L. E. = $\frac{20}{40}$? with + 1, $\frac{20}{20}$?

I tested him again May 23, and with + 11.50 ⊃ + 1 cy. ax 15, V. $\frac{20}{30}$? OS. + 1 = $\frac{20}{20}$)? Adds + 3 for reading. With these reads Jr. VI. readily with his injured eye and Jr. 1, with his left. I now ordered bifocal glasses for constant wear.

He reported July 19 that with his glasses he was troubled with

double vision, though he could see well with either eye alone. The cataract glass was now removed and plain lens substituted.

On Sept. 22 he again reported that eyes were so much better he thought he could now use the double glasses again. These were ordered, and, so far as I know, he is still using them. The recovery of this eye from so serious an accident, with so large an amount of useful vision, shows the possibility of nature, and the immense recuperative power of the healthy subject.

The Sometimes Successful Treatment of Cases of Apparently Incurable Blindness. Charles Bell Taylor.—Galvanization in optic troubles is especially insisted upon by Taylor, who reports remarkable successes in blindness after optic neuritis, corneal ulcers, etc. Next to this he would class mercury, which may be administered under the form of a blue pill, ointment, vapor, and sub-conjunctival injections. For the latter purpose he prefers cyanid. As a derivative he mentions blood-letting, which he thinks is too much neglected, also baths, counter-irritants, etc., which distract the attention of the nervous system from the disease. The cases he reports are apparently quite remarkable as regards his success.—*The Lancet.*

The Treatment of Chronic Granular Lids.—A. B. Dalgetty disinfects the conjunctivæ and neighborhood of the eye with corrosive sublimate, 1:1,000, and then injects ten minims of a five-per-cent. solution of hydrochlorate of cocaine into the loose skin of the lid, rubbing the same solution into the everted and thickened conjunctiva. The eyelid is then grasped with a pair of fine-bladed forceps so as to expose the whole diseased portion; then, with a pair of scissors curved on the flat, the entire thickness of the hardened membrane is removed down to the healthy tissue beneath. When the forceps is removed, free bleeding ensues, but it is arrested at once by the perfect apposition of the eyeball. A pad of lint and bandage is all the dressing required. The lids are drawn apart and the exudation washed away with boric-acid lotion twice daily until healing takes place, usually in four days. There is no deformity of the eyelid as a result of this treatment, neither is a general anæsthetic necessary, nor slitting of the canthus.

A CASE OF CONJUNCTIVAL TUBERCULOSIS, WITH PECULIAR ONSET, ENDING IN SPONTANEOUS HEALING.—REPORT OF A CASE FROM THE UNIVERSITY EYE HOSPITAL, ROSTOCK, GERMANY.

By A. LEVY, B. A., M. D.,
Pro Tem. Rostock.
OF MONTREAL, (CANADA)

The question of the spontaneous healing of conjunctival tuberculosis has been very much discussed, and hence the following case was of peculiar interest to us, as throwing light on this subject, and at the same time offering a peculiar clinical picture which may also be of interest.

A child, A. W., 3 years old, was brought, on the 28th of May, 1899, to the hospital, with the following history:

For some time previously the child had been suffering from a swelling of the right submaxillary lymphatic glands, and was being treated for this by a local surgeon. When fluctuation appeared and the abscess threatened to perforate, the surgeon made a long incision and removed, with the sharp spoon, as far as possible, all the necrotic tissue. The after-treatment consisted in packing with iodoform gauze. The wound did not heal kindly, but for some time continued to discharge considerable quantities of pus.

A day or two before the admission to the hospital there set in marked reddening and swelling of the right lids, especially the lower, upon which a diphtheritic membrane formed. The child was taken to a local eye-surgeon, who diagnosed "Diphtheria," and sent the child to be admitted into the isolation ward of the hospital. The patient had had no inflammation of the throat; neither had there been any diphtheria in the house.

On admission the following condition was noted:

Right. In the submaxillary region, a fairly large granulating wound, with considerable swelling round about.

Right Eye. Lids swollen; especially is the lower lid markedly oedematous. The mucous membrane of the lower lid is diffusely swollen and somewhat granular. The whole lower fornix and the greater part of the palpebral conjunctiva are covered by a cohesive whitish membrane, which is so firmly attached to the lid substance that it cannot be pulled off. The upper lid is also reddened and swollen,

but shows no membrane formation. A small quantity of purulent secretion is to be found. The cornea is clear and the deeper parts of the eye are normal.

Left eye normal.

Evening temperature, 102°.

We concurred in the diagnosis "Diphtheria." The child was shown in the clinic as a typical case and was confined to the isolation ward. The treatment consisted in injecting Behring's antidiphtheritic serum, in cleansing the parts with a solution of oxycyanide of mercury and the application of iodoform ointment.

A bacteriological examination was undertaken at three different times with bits of the membrane, but neither in coverslip preparations nor in cultures by the usual methods could any bacteria be found. The tubes remained absolutely sterile.

In the course of the next two weeks the pseudo-membrane slowly disappeared, not at all reacting to the antidiphtheritic serum. The lids, especially the lower, remaining distinctly swollen. The cornea remained clear.

On the 22d of June the patient was taken out of the hospital, after a stay of about three weeks. His mother took him to Warnemünde, a bathing resort on the coast of the Baltic sea. The condition at this time was as follows: The abscess in the neck is completely healed. The pseudo-membrane has disappeared, but left a large ulcer in the conjunctiva of the lower lid.

Seven weeks after his discharge, the patient was again received in the hospital. An examination under anæsthesia was undertaken, on account of the extreme restlessness of the child, the following condition being found: The conjunctiva of the right lower lid still very much swollen, although less than at time of discharge. Its surface is very uneven and granular, and covered by a slimy yellowish discharge, after removal of which a great ulcer with irregular edges and easily bleeding base was found. Round about this ulcer lay a number of small yellowish tubercles of about the size of pinheads.

On the upper lid are a large number of follicles, most numerous at the outer canthus. These resemble very much trachoma or follicular conjunctivitis. There are no ulcerations. On the left upper lid there is also a follicular conjunctivitis, without any inflammatory symptoms, similar to the condition of the right upper lid.

In the neck a fistula still persists. With a sound one can reach deep into the tissues on all sides, meeting with soft granulation tissue. The infiltration round about the scar reaches above to the neighborhood of the parotid gland and below to the angle of jaw.

A microscopical examination of the granulation tissue from the fistula as well as a bit of the diseased conjunctiva shows the typical picture of a tuberculosis, in the first with a find of tubercle bacilli. A bit of the conjunctiva was also implanted into the anterior chamber of the eye of a rabbit.

By these means the diagnosis of conjunctival tuberculosis was made certain. The necessity of radical surgical treatment was very impressively declared to the parents, but they absolutely refused to allow anything to be done, and took the child away to the sea-side. Two weeks later they came again, having decided to allow the necessary operation to be done, but in the interval the condition had changed very markedly.

Readmission.—The surface of the conjunctiva of the lower lid is still granular and ulcerated and shows many small yellowish follicular tubercles; a few of these follicles are also present on the upper lid, but they have much decreased in number. The whole conjunctiva is much less swollen than formerly, and the ulcer appears smaller.

The general condition of the child had much improved. On this account the surgical treatment previously decided upon was not carried out, only on the upper lid a few follicles were destroyed by the galvanocautery; the tuberculous ulcer and surroundings were not touched.

The child, who had been steadily improving, was discharged on account of a suspicion of having whooping cough. He was taken back to the sea-side, there well taken care of, and regularly given warm baths.

A few weeks after the implantation of a bit of conjunctiva into the anterior chamber of a rabbit, the animal showed an iris tuberculosis with typical appearance and symptoms.

Patient was once again brought to the hospital. Since his discharge the eye had become much better. He suffers from slight epiphora. The conjunctiva of the right lower lid is slightly swollen and reddened. In the reddened tissue several yellow follicles are to be seen, which project somewhat above the level of the mucous mem-

brane. There are no more ulcerated spots, and the swelling of the upper lid has entirely disappeared.

Patient readmitted to the hospital on account of a marked purulent discharge from the eye. The following was the condition then noted:

Right. In the inner canthus pus is to be seen. Pressure upon the lachrymal sac brings forth a large quantity of pus. The conjunctiva of the eyeball is somewhat injected. The lower fornix is somewhat shortened and shows scars; some scar formation is also present on the upper lid. In the outer canthus below are to be seen several small grayish-yellow tubercles and above many small follicles. An examination of the secretion for tubercular bacilli gave a negative result.

Removal of the entire lachrymal sac.

The wound healed by first intention without any retention of secretion, and only a slight epiphora remains. Patient discharged.

Since then the condition of the right eye has remained good, and the general condition of the child has improved.

An examination, on Dec. 27, 1900, showed *complete healing.* The mucous membrane of the lower lid shows an extensive scar, but is otherwise quite normal. Examination with the binocular loupe showed no tubercles in the pale and transparent mucosa. The very few small, glassy follicles of the otherwise quite normal upper fornix are similar to those which are present in the left eye, and are to be taken as a simple follicular conjunctivitis.

The *microscopic examination of the lachrymal sac* shows a *simple Dacryocystitis,* i. e., strong infiltration of small round cells. The submucous tissue very much thickened and infiltrated; the round cells at some points are grouped together in the form of follicles. There are many large vessels. The mucosa itself is much thickened and in some parts necrotic. A careful microscopic examination of the *entire* lachrymal sac failed to reveal any tuberculous tissue, or any epithelioid or giant cells. We are therefore enabled to say that it was not a tuberculous process in the sac, but only a secondary infection.

The question of the spontaneous healing of conjunctival tuberculosis has often been touched upon and very variously answered.

Brettauer and *Horner,* at the meeting of the Ophthalmological Society of Heidelberg, in 1881, gave it as their opinion that there were cases of tuberculosis of the conjunctiva which showed a marked tendency to spontaneous healing, in proof of which statement they cited several

observations of theirs. We are not told, however, if the diagnoses in these cases were made certain by microscopic examinations and animal innoculations. On this account these observations were not much considered in the literature of the subject, which almost throughout denies the possibility of conjunctival tuberculosis spontaneously healing.

Fuchs, however, in his text-book (1898), makes the general statement that exceptionally cases of spontaneous healing occur, but does not bring any further proof.

Parizotti[1] expresses the possibility that many doubtful cases of conjunctivitis, which heal spontaneously, may have been of a tuberculous nature.

The question has therefore always remained doubtful, so that very recently Eyre,[2] summing up the evidence, made the statement that conjunctival tuberculosis *never* shows any tendency to spontaneous healing. Against this statement, Reimar[3] published two cases of his own, and referred to the above cases in the literature of the subject. In his first case, however, no bacteriological, microscopical, nor innoculation tests were made to establish the diagnosis, so that we can only say that it was probably tuberculous. In his second case the process only healed after several years and after a complete destruction of the anterior parts of the eye and the formation of a total symble pharon had taken place, a course which cannot be characterized as benign; the disease was also very energetically treated.

Similar is the "healing" which Armaignac[1] describes. In this case the tuberculosis, which resembled trachoma very much, showed in part a spontaneous healing, but only after a big coloboma had formed in the upper lid, while the early death of the patient (phthisis) makes it uncertain that no recurrence would have occurred.

The only case about which more definite information is given is that of Strzeminski,[2] where a tuberculosis of the lachrymal sac and the skin over it healed spontaneously in the course of one and one-half years. Still the localization and form of this case is different from ours, which presents an ulcerating tuberculosis of the conjunctiva.

Our case is of interest in many respects. The patient had a tuber-

---

1 *Bollet. della R. Acad. Med. di Roma,* 1897.
2 *Archiv für Augenheilkunde,* 40, 2, 1899.
3 *Klin. Monatsblätter für Augenheilk.,* xxxviii Jahrg., Feb., 1900, p. 83
1 *Annales d'ocul.,* cxviii, 1897, p. 81.
2 *Recueil de Ophtalmologie,* 1899, p. 193.

culous abscess of the neck, which discharged considerable pus. From this, apparently through direct transference, an infection of the conjunctiva took place at the situation which Fuchs[3] describes as the usual commencing point of tuberculosis; that is a point slightly below the free edge of the lid, where a horizontal shallow furrow is found, and where foreign bodies are so very often retained. In the conjunctiva there appeared a very peculiar thing, and which has not as yet been described: a severe acute inflammation resembling a diphtheria, and indeed was treated as such. Later, when the tuberculous nature of the process was clearly manifest, surgical treatment was strongly advised. It was an only child, and the parents so extremely uneasy that they refused all surgical intervention. We must acknowledge that the obstinacy of the parents was of service to the child and served us as instruction.

It is not easy to explain the clinical picture in this case. We must assume that the neck tuberculosis was the primary focus; otherwise we would expect an enlargement of the preauricular glands, which in the beginning was not the case. And for the same reason we must assume that the infection followed a direct transference of the infecting material. The clinical course may be explained by two different assumptions. One could assume that the tranferred pus was purely tuberculous, and the process in the conjunctiva during the incubation period, and perhaps even longer, pursued a latent course, and, as the result of some cause or other, suddenly became manifest under the picture of an acute necrosis of the tissue, and only after the termination of this acute attack it appeared in its usual ulcerating and chronic form.

It is also possible—one might even say probable—that the pus from the neck abscess contained also pus-forming microbes of some form, although the cultures from this pus always remained sterile, and that these germs caused the necrotic process, in the course of which the tubercle bacilli in the transferred pus sank deep into the tissues and after the incubation period they produced chronic ulceration, which only became manifest after the disappearance of the acute disease. Which of these possibilities is correct, must remain undecided.

When the child, after a long absence, during which it received no treatment at all, again came to the hospital, we found, to our great

[3] Sitzung der Ophthalmolog. Gesells. zu Heidelberg, 1887, p. 68.

surprise, that the process, spontaneously, had much improved, and that scar tissue had commenced to form over the ulcer. It is now over a year since the process is healed, and during this period the very last tubercles have disappeared, so that it is permissible now to speak of a spontaneous healing. It is true, as Fuchs says, that recurrences may occur after long periods, but in the complete healing of our case we hold this to be improbable. We will, however, keep the patient under observation.

If with this case the possibility of a spontaneous healing of conjunctival tuberculosis is made certain, I still believe it to be rare. One cannot count with any degree of certainty upon such a result, and the prognosis of conjunctival tuberculosis still remains extremely unfavorable. In all cases we must use energetic treatment, as Vieusse[1] recently declared. The indications for treatment remain practically the same, only more importance will be placed upon general constitutional treatment. Where possible, residence at a health resort, especially at the sea-side, will be advised.

Our case changes the statement of Eyre about the spontaneous healing of conjunctival tuberculosis, to the extent that in certain exceptional cases there is a very definite tendency to spontaneous healing.

Finally, we wish to mention the recent cases of Kuhnt[2] and Zimmerman.[3] In Kuhnt's case a complete cure of an obstinate conjunctival tuberculosis followed an intercurrent erysipelas. In Zimmerman's case a definite improvement, which persisted for a long time, of a tuberculosis of the cornea and iris took place, also after an erysipelas. These may be taken as cases of spontaneous healing; still the cases are different from ours, where the healing was absolutely spontaneous.

I desire, finally, to thank Professor Axenfeld for his kindly assistance, and for his goodness in leaving me the above material.

1 *Recueil d'Ophtalmologie*, 22 iene Année Janv., 1900, p. 1.
2 *Zeitschrift für Augenheilk.*, Band iii, 2. Feb., 1900.
3 *Zeitschrift für Augenheilk.*, Band iv, 2. Aug., 1900.

THE CONTROVERSY ABOUT THE DIOPTRIC VALUE OF THE CORNEA.

By CARL WEILAND, M. D.
PHILADELPHIA, PA.

In the April issue of THE OPHTHALMIC RECORD, Dr. W. Suter objects to my criticism of his article in which he states that the cornea has no fixed dioptric value. In that reply the doctor only repeats his former incomplete argumentation and as, according to his own statement, he was unable to clearly understand my reasoning I shall state again the main point at issue in the hope to make myself better understood.

Dr. Suter asserts that the cornea has no fixed dioptric value because it would require a different convex lens at the apex of the cornea for every point on the axis from which rays emanate and are brought to a focus again by the cornea. Now that a different lens must be placed at the apex of the cornea in order to focus in air the rays of light at the same point as the cornea does for every different luminous point on the axis is so elementary a proposition that it must appear self-evident to every student of optics. But that has nothing to do with the *dioptric power* of the cornea. For the dioptric power of a lens or refracting surface or system refers only to *parallel* rays or *plane* waves of light, and only to that medium of the objects of which we want to form images. Only *parallel* rays of light are used to measure the dioptric power of a lens or refracting system and it is clear, therefore, that any argumentation of Dr. Suter based on *diverging* rays is of no value and wholly untenable.

Furthermore the doctor assumes that the lens expressing the dioptric power ought to be placed at the apex of the surface, the refraction of which is to be expressed. But why should a lens be placed there at the principal point when a refracting surface has *four* cardinal points which are all of equal importance? It is true that the proper convex lens at the principal point will bring parallel rays of light to the same focus as the cornea, but the images of distant objects in air formed by this lens would be much too large. Thus for rays parallel in air the cornea of 7.8 m. m. radius could be placed at its apex by a lens of +32.31 D, but the images of distant objects in air formed by a +32.31 D lens in that position would be about 1.34 times too large.

Of such a lens indeed it cannot be said that it does the same refractive work as the cornea. As little as this has been asserted about a lens in air placed at the apex of the eye and converging parallel rays of light to a point on the retina. A lens in that position would have to be of 43.7 D, but cannot express the refractive power of the eye. Let us hear what Prof. Albrecht Nagel, who is only second to Donders in the exposition of the refraction of the eye, had to say on this subject more than 20 years ago. He states in Graefe and Saemisch (Vol. VI, p. 260, 1. Ed.): "If we speak of the dioptric power of the eye [cornea] in the same sense as we do of the dioptric power of a lens it can have only the meaning of a comparison. . . . This dioptric power of the eye [cornea] may be put down very approximately equal . . . to a lens of a focal distance which is equal to the *anterior* focal distance of the eye [cornea] and which must be put at the second *nodal* point of the eye [cornea]. In the latest schematic eye [cornea] of Helmholtz for example the dioptric power of the media [this medium] may be considered equal . . . to a sphere lens of 15.5 m. m. [23.14 m. m.] focal distance, or a dioptric power of 64.5 D [43.20 D] placed at the second nodal point of the eye [cornea]." In this quotation I have added in brackets the words which when put in place of the preceding word will make it apply to the cornea; for that the same reasoning is correct for eye and cornea will be evident if we consider that the cornea may be looked upon as the same compound refracting system as the eye, in which, however, the two principal points have merged into one principal point at the corneal apex, and the two nodal points have merged into one nodal point at the center of the refracting surface.

Furthermore Dr. W. S. Dennett and Dr. C. W. Cutler in "An American Text Book of Diseases of the Eye, Ear, Nose and Throat," give a definition of the dioptric power of a single refracting surface like the cornea which agrees perfectly with mine. They say there (p. 123): "The strength or power of a lens is the convergence that it can produce in *parallel* rays. It is also the curvature it can give to a *plane* wave that passes through it; it is also the reciprocal of its focal distance. Either one of these definitions implies the other. Whichever way it is defined, $\frac{1}{F}$ is its measure. This definition must be modified for a single surface or a system other than a lens. The dioptric strength of such a system is consistently considered to be the measure of the curvature in *air* or vacuum which it will impress on a wave

that was flat before reaching it. Some such convention must be adopted, as the convergence produced is greater on the side of the lesser index, though the system is the same. With this limitation we can evaluate systems as well as lenses in diopters, and the value will be the index of the last medium divided by the length of the principal focus in that medium. With this convention the dioptric value of a system is the same for light traveling in either direction."

If we apply this to the cornea it is evident that its dioptric value is to be defined either by the refractive index of air 1 divided by the anterior focal distance F_1 that is by $\frac{1}{F}$, or by the refractive index of the aqueous n divided by the posterior focal distance F_2 that is by $\frac{n}{F_2}$. But as $F = n F_1$, we see that $\frac{n}{F_2} = \frac{1}{F}$. Both these values are the same and identical with that given above. This definition of the dioptric value of a single refracting surface is quite comprehensive, but very formal, whilst my definition of it, as expressed by that lens which gives images of distant objects in air of the same size and at the same place as the surface does, gives a fuller and more practical significance to that term. This definition allows us to see at once that the dioptric value of the cornea, with reference to parallel rays of light in air, can be expressed only by a lens at its center and of a focal distance equal to its anterior focal distance. The dioptric value of the cornea has been thus expressed by Javal and Tscherning.

From the foregoing exposition the following conclusions must be accepted:

The cornea has a fixed dioptric value.

This fixed dioptric value is expressed by a convex lens, the dioptric power of which equals the reciprocal of the anterior focal distance, the lens being placed at the center of the cornea. Such a lens of +43.20 D for a cornea of 7.8 m. m. radius, placed at the corneal center, will give of distant objects in air images of exactly the same size and at the same place in space as the real cornea does. This lens does the same refractive work on parallel rays of light in air as the cornea. Both, therefore, have the same dioptric value.

The formation of equal images of distant objects as an essential condition to be fulfilled by a lens which is to be the equivalent of the dioptric power of a refracting surface or system has been entirely overlooked by Dr. Suter and has caused him to make the untenable assertion that the cornea has no fixed dioptric value.

TREATMENT OF EXOPHORIA.

By WALTER R. PARKER, M. D.
DETROIT, MICH.

The tendency of the visual lines to diverge from the normal is a form of heterophoria more or less common and one that is productive of grave symptoms.

The normal position of the visual lines has not been definitely determined, but the opinion of the most careful observers seems to place it at from 1½ D. to 2 D. esophoric.

Grut says: "Divergence of the visual lines cannot be produced at will, and when found must result from abnormality; but that latent divergence is often concealed by convergence, which exists both as a voluntary and reflex act."

The average normal exophoria in accommodation is from 4 D. to 5 D. I do not think the opinion of those who claim that 2 D. exophoria for 13 inches is normal is borne out clinically.

The average difference of divergence between far and near is about 5 D. Thus a patient with 2 D. of esophoria for distance will have about 3 D. of exophoria at 14 inches.

In cases of orthophoria, the average normal power of divergence is about 7 D., and the ratio of the power of divergence to the power of convergence is about 1, to 3 or 4. A patient with a power of divergence equal to 7 D. should have a power of convergence from 21 D. to 28 D.

There is no one symptom that is pathognomonic of exophoria. Headache, frontal and occipital; asthenopia, with dizziness and nausea; rapid exhaustion, with diplopia after prolonged near work; any combination of these symptoms together with diverse nervous manifestations may present itself in this form of heteraphoria.

To determine the amount of exophoria present in any given case, repeated tests should be made after careful refraction under a mydriatic. To treat it successfully, the condition of the ocular muscles, both for distance and accommodation, must be determined. We must also have constantly in mind the patient's general health and hygienic surroundings.

As I wish particularly to speak of the treatment of uncomplicated cases of exophoria, I will dismiss all cases due to general diseases, as rheumatism, neurasthenia, etc., with this simple injunction: Never hope to cure a disease by treating a single symptom.

In exophoria there is always comparative excess of power of divergence. This may be due to excessive strength of the power of divergence, or to abnormally weak power of convergence. Eliminating other than ocular conditions as the cause of the form of heterophoria under consideration, there remains accommodative and muscular exophoria.

In myopia the exophoria may be due to lack of accommodation, which is curable by the constant wearing of the full correction of the refractive error.

The following case illustrates this class of cases:

Mrs. D., aged 25; extreme asthenopia, with inability to do any near work with comfort. Under homatropine, the following correction was accepted:

O.D. s.—2.00—c.—1.00 ax. 105°—$\frac{6}{5}$.
O.S. s.—2.00—c.— .50 ax. 180°—$\frac{6}{5}$.

Without correction the muscle tests showed an exophoria of 15 D., while with the full correction, it was reduced to 3 D. the power of divergence being 7 D., power of convergence, 15 D. The more distressing symptoms disappeared at once, but it was not until the power of convergence had been developed to 50 D. and the 3 D. exophoria reduced to 1 D. esophoria, that comfort was established. In rare cases it will be necessary to do a tenotomy of the external recti before relief results, even though the exophoria for distance be overcome through accommodation.

When there is lack of power of convergence, with an exophoria of 0 D. to 4 D. most satisfactory results may be obtained by the use of prisms after Gould's method, which is as follows:

Place a light at 20 feet on a level with the eye and with a prism, base out, as strong as the muscle can be coaxed to overcome, exercise the muscle by alternately raising and lowering the prisms before the eyes. This should be done for three minutes, three times daily. Increase the strength of the prism as fast as possible until a total of 50 D. can be overcome. I have never found it of advantage to develop the power of convergence above this amount. It usually requires about two weeks to reach 50 D., where it should be kept during the three or four weeks of exercise.

If difficulty is experienced in fusing the images at 20 feet, raise the prisms, approach to within three or four feet of the light, replace the prism, and after the lights are fused, back away, constantly observing

the lights. A few trials will suffice to teach the patient the knack of bringing the lights together.

The history of the following case will serve as a type of this form of exophoria: H. J., male, aged 35; a compound myope, wearing in each eye S.—1.00=C.—.25 ax. 180°, suffered from extreme frontal headache, with nausea and general fatigue after attempts to do near work. Although refracted under a mydriatic and given full correction, the symptoms were not relieved. Muscle tests showed an exophoria 1 D. for distance, with 8 D., in accommodation. Power of convergence, 25 D., power of divergence, 8 D. After using the prisms two weeks, the exophoria was reduced to 0. and all the symptoms had disappeared. The treatment was continued, however, four weeks longer, when the 1 D. exophoria was reduced to $2\frac{1}{2}$ D. esophoria for distance, with 1 D. exophoria in accommodation; power of convergence being 40 D., divergence 12 D. The symptoms have not returned, although the patient has been under observation six years.

Many cases where the exophoria has been reduced from 2 D. to 3 D. to orthophoria, or 1 D. to 2 D. esophoria, might be cited, but I will add only one more.

G. G., male, aged 21; a compound hypermetrope, wearing 0 D. c.+.75=c.+.75 ax. 100°, O.S. s.+.75=c.+.75 ax. 90°; although $\frac{1}{4}$ less than full correction had been worn for several months the headaches, frontal and occipital, together with a marked chronic catarrhal conjunctivitis, continued. On June 9, 1897, a muscle test gave the following result: Exophoria for distance, 2 D.; exophoria in accommodation, 9 D.; power of divergence, 12 D.; power of convergence, 13 D. It will be noticed that while the ratio between the exophoria for distance and in accommodation is about normal, both are excessive. After two weeks' treatment by the use of prisms, the power of convergence was increased to 50 D., while the exophoria was reduced to 0 D. for distance, and to 6 D. in accommodation, with the power of divergence unchanged at 12 D.

This patient was under observation three years and, although the power of convergence was reduced to 35 D., muscle equilibrium was preserved, and optical comfort established.

In cases where the exophoria persists after the power of convergence has been developed to 50 D., the eye may be allowed to seek its place of rest, if the divergence is not more than 4 D., and the visual lines made parallel by the use of prisms, or by decentering the lenses.

If the divergence is more than 4 D. a tenotomy is indicated. A single tenotomy of the externus will correct from 5 D. to 6 D. if care be taken not to divide the attachments. Should the error be over-corrected, a suture should be introduced at once, the patient placed before the phorometer and the error for distance reduced to 0 D. by tightening or loosening the suture. If the error has not been over-corrected, it is better to aim at 2 D. or 3 D. esophoria as the final position. The effect of simple tenotomy can be increased by dividing the attachments in some cases to 6 D. or 7 D.

When exophoria is complicated by hyperphoria the problem is more difficult of solution. The general rule to correct the hyperphoria first, is not always a safe procedure, especially in cases where the exophoria is far in excess of the hyperphoria. Occasionally the vertical error is manifest only after the lateral deviation is fully developed. If diplopia can be produced by the use of a red glass, ask the patient to describe the course of the displaced image; usually it will go diagonally in and down, or in and up, but at times it will go in until the lateral deviation is all manifest, and then up or down as the case may be. In such a case, it would be poor surgery to operate on the superior rectus. These cases are very rare, however, and as a rule, when marked hyperphoria, 2 D. or more exists, it should be corrected first.

That the vertical deviation may disappear upon the correction of the exophoria is shown by the following case:

M. M., female, aged 25, wearing O. D. s.—.25⊖c.+.87 ax. 75°, O.S. s.—.25⊖c.+.50 ax. 120°. Exophoria for distance, 5 D.; in accommodation, 12 D.; power of divergence, 15 D.; power of convergence, 10 D. R. hyperphoria 1 D. Although the power of convergence was increased to 50 D. the muscle error was not changed. After tenotomy of the right external rectus, the hyperphoria disappeared and the 5 D. exophoria was reduced to $1\frac{1}{4}$ D. esophoria for distance, and to $3\frac{1}{2}$ D. exophoria in accommodation.

The treatment of exophoria might then be summarized as follows:

1. Eliminate the possibility of the imbalance being a symptom of some general disease or nervous disturbance.

2. Refract carefully under a mydriatic.

3. If deviation is under 5 D. increase the power of convergence to 50 D.

4. If glasses must be worn for refractive error, decenter or add prisms up to 4 D.

5. Tenotomy or advancement.

912 Chamber of Commerce.

ABSTRACTS

FROM CURRENT OPHTHALMIC LITERTURE.

By G. E. de SCHWEINITZ, M. D. AND C. A. VEASEY, M. D.

Retinal Changes in Chronic Anaemia. In regard to the retinal changes so frequently observed in the chronic anæmias Pick *(Klin. Monatsbl. f. Augenheilk., March,* (1901) gives the following conclusions:

1. In all chronic anæmias retinal changes occur principally manifested as hemorrhages and retinal plaques. They are frequent and are almost constantly found in malignant tumors of the stomach.

2. Their cause has not yet been entirely cleared up. They are not proportional to the anæmia; perhaps they resemble the influence of toxines, clinically resembling the anæmias of sepsis and endocarditis.

3. Transient albuminuria (congested kidney) may also give rise to similar retinal changes. In chronic nephritis analogous changes frequently have no unfavorable prognostic significance and occasionally improve; on the other hand the typical grave albuminuric retinitis always gives a very unfavorable prognosis.

4. Analogous to the retinal plaques are probably the lesions in the spinal cord found by Minnich in the grave anæmias.

5. The retinal changes are functional and almost always without any significance. Even the gravest retinal degeneration and formation of swellings in the choroid may occasionally run their course without symptoms.

New Prothesis for the Orbits of Children. In discussing the kind of prothesis most suitable for the child's orbit, Müller-Söhne *(Klin. Monatsbl. f. Augenheilk.,* March, 1901) state that only such should be employed as are light and smooth in character and for this purpose nothing can surpass molten glass. In making the prothesis for a child it is not sufficient to grind down the normal eye of an adult in stock with a radius of 12 m. m., which is really more than the extirpated eye, but it should be pressed together, spherical, narrow and deep, with a radius of 6½ to 10 m. m. It is impossible to do this in celluloid, independent of the fact that physician or optician seldom possesses the apparatus to polish carefully the cut surfaces. Such properly con-

structed eyes are particularly durable as regards breaking from injury.

The Central Black Spot in Myopia. Fuchs *(Zeitschrift f. Augenheilk.,* March, 1901) directs attention to the fact that a circumscribed central black spot is frequently seen in the macular region in high grade myopia, which in the course of time undergoes considerable change. The disease generally begins with a sudden disturbance of vision and metamorphosia. Often a dark spot is noticed by the patient in the center of the visual field which to some appears dark and to others greenish or reddish. In many cases a marked scintillation is observed by the patient in the neighborhood of the spot and this symptom, if present, is persistent and alarms the patient considerably. The visual acuity is always lowered and in some cases is not more than from one-fourth to one-tenth of normal. A central scotoma is found and in fresh cases may be relative, only thus permitting the patient to continue his reading with some difficulty. Later, however, it always becomes absolute. In the early cases, the ophthalmoscope detects the characteristic macular black spot, the size of which, in this stage, is somewhat smaller than the papilla; exceptionally it is somewhat larger. The spot is generally circular and sharply defined, is occasionally black throughout, but usually its center is a delicate red, or more rarely a gray or white. The spot is sometimes observed in an otherwise normal fundus, but most frequently other changes are seen accompanying it. It is sometimes surrounded by a zone in which the retinal pigment epithelium seems to have been absorbed, exposing the choroid beneath, and occasionally one may find a small hemorrhage either on the spot or in the immediate neighborhood.

Certain changes take place in course of time, chiefly three in number: enlargement, a clearing up and the formation of an atrophic zone. The enlargement occasionally exceeds the size of the papilla and with this there is more or less change in form to an oval or slightly irregular shape. In the beginning the color of the spot is more intense in the center, but later it becomes slate color, whitish or bluish white. Never has the choroid or sclera been seen through the spot and it is therefore deduced that the choroid is not destroyed, but has either changed itself into a callosity or has been permanently covered by a callosity. Rarely the spot so clears that nothing remains but a circular line of pigment, inside of which there may be a few pigment striæ or spots. The zone around the spot appears to be due to an absorption of the pigment epi-

thelium which may later become an atrophy and even extend into the surrounding portion of the fundus. The spot having once appeared never entirely disappears and never does the normal visual acuity return.

The Prognosis and Therapy of Traumatic Luxation of the Lens. After reviewing the symptoms usually found in this condition Stoewer (*Zeitschrift f. Augenheilk.*, March, 1901) states that the complications are secondary glaucoma, cyclitis, sympathetic irritation and injury to the endothelium of the cornea, producing attachment between it and the lens. In secondary glaucoma the myotics do not seem to be of marked or lasting value, though these constitute the best drug treatment. Operative procedure (extraction, iridectomy, or sclerotomy) is usually required and the following are the indications:

1. In luxation into the anterior chamber, always, and as soon as possible, extract.

2. The imprisonment of the lens in the pupil should, if possible, be reduced to a luxation in the anterior chamber and treated as such.

3. If the luxation is into the vitreous, and after the primary irritation produced by the injury has disappeared, no inflammatory symptoms arise, one can wait by employing the myotics; but even in these cases extraction is not contra-indicated. Extraction would be indicated at once if glaucoma, or cyclitis by mechanical irritation, or sympathetic irritation of the other eye were present. In total luxation of the lens into the vitreous one may attempt by simple manipulation to bring the lens into the anterior chamber. In partial luxation where a portion of the zonule is still preserved the corneal section should be made opposite this portion; otherwise above. If the lens lies in the pupillary area it should be delivered with the loop or by Knapp's pressure manœuvre. This manœuvre should also be attempted if the lens is in the vitreous, and in those cases only in which there is great danger from much loss of vitreous should the loop be used with artificial illumination. If this be ineffectual an iridectomy is performed and the extraction operation abandoned to be attempted again in a few weeks when fixation with a needle is permissible.

Should glaucomatous attacks arise at a time when, on account of the refractive media, the diagnosis cannot be made with certainty, or if the lens cannot be localized in the vitreous, sclerotomy is indicated. Enucleation cannot always be prevented and the following are the indications given for this extreme measure: Threatened sympathetic inflam-

mation, infectious cyclitis with amaurosis, which cannot be prevented by the customary remedies, cyclitis, and glaucoma following futile attempts at extraction.

Concerning the Treatment of the Ocular Complications of Small-Pox. M. Dufour (*Annales d'Oculistique*, May, 1901) writes concerning the ocular complications of small-pox, and quoting Landesberg, gives the following table.

Among 270 cases of the ocular lesions of small-pox, there occurred:

Affections of the conjunctiva	57.78%
Affections of the lachrymal apparatus	5.55%
Affections of the lids	1.11%
Affections of the cornea	30.00%
Affections of the iris	2.96%
Affections of the uveal tract	1.48%

From this it is apparent that affections of the cornea and the conjunctiva practically represent all of the important complications of this affection. In all cases of small-pox the conjunctiva is congested, turgescent, and sometimes even œdematous, which makes it appear as if attacked by a violent catarrh. It may be so violent that it gives the impression of a purulent conjunctivitis. Every now and then the bulbar conjunctiva is attacked with pustules. The cornea itself is not the situation of variolous pustules. So the corneal lesion does not often occur during the period of eruption. When the cornea is affected it is at a period later than the general malady, especially at the time of the dessication of the pustules, and of the different suppurative foci in the body. The first appearance of the malady is generally at the border of the cornea with suppurative infiltration at the bottom of the ulcer. The pus corpuscles infiltrate the layers of the cornea and the grayish-yellow spot extends more and more. Its progress is very like the traumatic ulcer which has been infected by a blennorrhœa of the lachrymal sac. At other times the primary lesion commences at a certain distance from the border and perhaps owes its development to an erosion of the corneal epithelium. The suppurative lesion grows larger and deeper, at a certain period hypopyon appears, which in general coincides with a participation of the iris in the process. If the disease is not checked the usual consequences of this type of keratitis become apparent. Dufour then gives an account of a case of this character in which an excellent result was achieved by the systematic use of subconjunctival injections of sublimate, 1-2,000.

Hepatic Organo-Therapy in the Treatment of Essential Hemeralopia. Trantas *(Abstract Annales d'Oculistique,* May, 1901) has published in the *Semaine Médicale* the results of his researches in hepatic organotherapy in hemeralopia. In essential hemeralopia, that is to say, one which is not symptomatic of pigmentary retinitis and which one observes in individuals whose hygiene and nutrition are defective, recourse is generally had to tonic medicaments, in particular to cod-liver oil. However, Hippocrates recommended in this affection the ingestion of beef liver in large quantities. This therapeutic measure which certain old-time practitioners praised in their day is scarcely ever used at the present time. Remembering the success of modern opotherapy, Trantas conceived the idea of experimenting anew in ten cases of rebellious hemeralopia. Under the influence of the ingestion of beef and sheep liver, boiled or stewed, in a daily dose of 200 grammes, he has seen improvement in hemeralopia on the evening of the first or second day, and the xerotic choroido-conjunctivitis, which in certain cases accompanies the affection, disappeared at the end of ten or fifteen days. Trantas believes that this is due to a regenerative action on the retinal purple which is the favorable effect of hepatic opotherapy on essential hemeralopia.

Prognosis and Therapy of Perforating Infected Wounds of the Eye Ball. In treating 160 cases of fresh wounds of the bulb, Schirmer *(Bericht der Münch. med. Woch.,* 1900, 7; abs. *Woch. f. Therapie u. Hygiene des Auges,* March 7, 1901) states that sixty-nine were aseptic. In sixty the visual acuity was finally preserved. On account of the severity of the wounds four were enucleated at once, two after a short time and three were left in situ with phthisis bulbi without irritation. Among ninety-one infected injuries forty-five were purulent and forty-six were chronic fibrinous in character.

Conclusion: Conservative treatment must always be attempted when the eye is not yet absolutely lost. An eye can be considered lost only when it is entirely shattered or when a pronounced panophthalmitis is present. In forty-five cases of purulent infection twenty-two were exenterated at once. Of the twenty-three eyes treated conservatively, fair to good vision was preserved in twelve. In the forty-six cases of fibrinous inflammation the conservative treatment was always employed. In these vision was preserved in twenty-one, the bulbs were preserved without vision in five, and in the remaining cases subsequent enucleation had to be performed. Sympathetic inflammation did not

occur in any case. These very good results Schirmer attributes to mercurial inunctions in large doses (6 to 9 gms. daily) and persistent rest in bed. In addition sub-conjunctival injections, diaphoresis, atropin and the bandage were employed.

Concerning the Modified Open Wound Treatment after Operation upon the Eye Ball. In discussing this subject Heimann *(Münch. med. Woch.,* 1901, 8; abs. *Woch. f. Therapie u. Hygiene des Auges,* March 7, 1901) reaches the following conclusion:

Against the bandage as ordinarily used are the following facts:

1. The bandage is easily movable and in an improper position exerts a harmful pressure upon the eye ball.

2. The bandage gives rise to an increase of micro-organisms always present in the conjunctival cul-de-sac by means of a stagnation of the secretion and increase of temperature.

3. The physiological action of the lid which does away with the secretion and bacteria so excellently is impeded.

4. The bandage, particularly when lightly applied, exerts a pressure upon the sclera and gives rise to a gaping of the wound.

5. The physical influence of the bandage, especially if binocular, and the inconvenience in summer, or in a heated room, are so well known as to scarcely require mention.

By modified open wound treatment the author means to leave the eye free from every bandage directly applied to the eye ball and by the application of a protected apparatus to make the opening and closing of the lids possible. With such an apparatus the eye, as in the normal condition, is allowed to remain open.

For the modified protective bandage are the following facts:

1. Protection of the eye from mechanical injuries.

2. Facilitating the removal of the bacteria from the conjunctival sac by permitting opening and closing of the lids.

3. More rapid decrease in the irritability of the operated eye in consequence of the prevention of stagnation.

4. A better coaptation of the wound margins and a decrease of the annoying operative astigmatism.

5. A decrease in the annoyance to the patient.

6. Decrease in the possibility of a psychical disturbance.

7. An easier and more convenient control in subsequent treatment.

New Eye Remedies in 1900. Wolffberg *(Woch. f. Therapie u.*

Hygiene des Auges, March 14, 1901; abs. from *Merck's Journal)* reviews some of the newer remedies as follows:

1. *Abrin.* Applied to the healthy conjunctiva of a rabbit abrin causes an accumulation polynuclear and mononuclear leucocytes, accompanied by an enormous sero-fibrinous exudation and a desquamation of the epithelium of the conjunctiva. In granular conjunctivitis the false membrane is infiltrated with leucocytes in two or three days after the abrin ophthalmia. This drug, therefore, exerts upon the healthy as well as upon the granular conjunctiva a positive chemotaxis toward the polynuclear leucocytes. Calmette and Ehrlich have been able to produce immunity from abrin in rabbits as the serim is strongly antitoxic. In man analagous results were obtained. The efficacy of abrin, therefore, depends upon the formation of such cellular tissue as causes the change from granulation to fibrous tissue. The quick disappearance of the pannus may be attributed to a true leucocytic thrombosis in the terminal vessels. Very weak solutions should be employed (according to Ehrlich, 1-500,000) and the strength gradually increased. Solutions do not keep well in warm weather.

2. *Iodic Acid.* In the treatment of chronic trachoma Schiele employs iodic acid in the shape of solid sticks for topical applications. Without cocain anesthesia slight pain is produced. In beginning trachoma, pannus, torpid ulcers and infiltrations, a 1 per cent to 3 per cent solution can be instilled or a 1½ per cent salve employed. In interstitial keratitis, or in cases where increased activity of the remedy is desired, iodide of potash may be given internally at the same time.

3. *Acetico-Salicylic Acid* (*Aspirin*). This drug is a very valuable antipyretic and an excellent anti-neuralgic in which the disagreeable effects of salicylic acid are avoided. It is employed in acute articular rheumatism and neuralgias of all varieties and is recommended as efficient in diseases of the eye depending up a gonorrhœal-rheumatic basis (Wicherkiewicz, Wolffberg). Kohn and Gazert found some disturbance of the stomach accompanying its use.

4. *Atrabilin.* This is a preparation made from suprarenal extract. The following conclusions have been reached regarding its action:

1. It produces marked pallor of the whole conjunctiva, as well as of any existing ciliary injection and pannus, within one-half to one minute after instillation.

2. The drug itself has no marked action upon the pupil, but assists the action of the alkaloids.

3. Its action decreases intra-ocular tension.

4. It decreases lachrymation.

5. It assists the anesthetic action of cocain and produces anæmia in operation upon the lids.

6. It has extensive cosmetic effects.

5. *Dionin.* This is an easily soluble morphia derivative which in 5 per cent solution will produce chemosis, and in 2 per cent solution is a very good local analgesic. It is employed to advantage in iritis, irido-choroiditis and glaucoma. Of the weaker solution two drops should be employed every two hours for eight drops; of the 5 per cent solution a single instillation of one to two drops is sufficient to produce chemosis.

6. *Guajasano.* This drug occurs in the shape of white prisms which melts at 148 degrees C., and smells something like guaiacol. It has a bitter taste and is quite soluble in water. It is recommended in 1 per cent solution as a cleansing agent in superficial injection of the eye ball and in inflammatory injections of the conjunctiva.

7. *Largin.* Largin is one of the newer silver preparations that has been employed to advantage in blepharo-conjunctivitis and in certain cases of dacryo-cystitis. It is a good substitute for silver nitrate in acute contagious conjunctivitis and in acute or sub-acute trachoma.

8. *Validol.* Some good results have been reported from the use of this drug in scintillating scotoma because it effects both the scotoma and the accompanying headache. The remedy is entirely harmless and can be used for some time without pernicious results. It is employed in a dose of from fifteen to twenty drops, and if the visual disturbance does not abate after the first dose it is repeated in five minutes.

Itrol. Luciani (abs. *Woch. f. Therapie u. Hygiene des Auges*, March 21, 1901) states that in many cases of ophthalmia neonatorum he has employed itrol with good results and recommends it because it possesses astringent and disinfectant properties and claims that it even surpasses silver nitrate in value. It does not affect the cornea and produces less pain than other similar remedies. The solutions can be given to the patient for home use, but fresh preparations must be employed and protected from the light and air.

Concerning the Neuroglia in Optic Neuritis. Nuel refers to the fact that (*Bull. Acad. roy. de Med. Belg.*, 1900, *sér.* 4, *t*, *XIV*, *p.* 313. Abstract in the *Annales d'Oculistique, May,* 1901) in inflammations of the optic nerve an important rôle has been ascribed to the connective

tissue, which may produce an atrophy by compression. Very little attention has been paid to the neuroglia. A transverse section of the optic nerve is habitually figured as with a ring of connective tissue at the periphery and around the fascicles. These rings are supposed to convey prolongations towards the interior. According to Nuel, the interfascicular septa consist in great part of neuroglia, and the intrafascicular septa entire of neuroglia. According to his researches, in every neuritis the nervous fiber is affected first, and the neurogliar fibers and cells are affected later in the form of proliferation. They tend to take the place of the nervous fibers. Finally the connective tissue proliferates. Now one, now the other, process predominates. The connective tissue predominates especially when the neuroglia softens, following defective nutrition. If only the terminal stages of inflammation are examined, the description includes only that which was observed at that time, namely, the proliferation of the connective tissue.

In ficilic neuritis the alterations starting in the eye then pass to the optic nerve. First an alteration, followed by a rapid destruction of the nervous fibers, develops, accompanied by an interstitial œdema which distends the neurogliar sheaths. After the disappearance of the nervous fibers, the neuroglia is isolated in an ideal way. At the end of about eight days the fibers and the cells proliferate, the last in a manner so very intense that they resemble an accumulation of leucocytes. Then the neuroglia softens (a) by the formation of epithelioid cells; the fibers disappear, and the cells proliferate, forming large cells with little angular nuclei and large hyaline cellular bodies with fine striations; or (b) by a necrobriosis. The fibers disappear first, then the cells. In this manner cavities filled with liquid are created, with altered vessels and with hypernucleated connective tissue.

Lime Burn of the Eye.—Cane sugar in concentrated solution forms an insoluble compound with lime, so it may be used after mechanical removal of larger particles. Cleanse every part of conjunctiva with oil, dilute vinegar or water; then use boric solution and perhaps atropine.—Posey.

THE
OPHTHALMIC RECORD
A MONTHLY REVIEW OF THE PROGRESS OF OPHTHALMOLOGY.

VOLUME X. CHICAGO, JULY, 1901. No. 7. NEW SERIES

EDITORIAL.

THE RECOGNITION ABROAD OF AMERICAN WORK IN OPHTHALMOLOGY.

If the situation be rightly regarded, there is no ground for the feeling that one is very seriously handicapped, in the race for professional honors, by a residence in America. It is a perfectly natural thing that men should look for fresh suggestions in science to those quarters from which valuable suggestions have heretofore most frequently appeared, and should be less quick to recognize those which come from new quarters. But let those who live in other parts do equally good work, and the world will, in time, come to look in their direction for such things. The change of attitude cannot be immediate; but it will occur, and is even now occurring.

Within three years, a prominent European ophthalmologist wrote to a confrere in Philadelphia, asking that his son might have an opportunity for a practical acquaintance with American methods of working. Any one who follows the European literature knows that in it references to American authors and American cases steadily increase. Some of the French ophthalmic journals publish regularly the proceedings of the Sections on Ophthalmology of the College of Physicians of Philadelphia, and the New York Academy of Medicine. In the last number of the *Klinische Monats-blaetter für Augenheilkunde* the bibliographie contained the titles of thirty-two papers by American authors, more than 18 per cent of the whole number, representing the current ophthalmic literature of the world. The writer recalls an article by Rohmer, in the *Annales d'Oculistique* for June, 1899, in which, out

of nineteen papers mentioned in the bibliography, ten were of American authorship. In the last three numbers of the *Revue Generale d'Ophtalmologie* there are abstracts of fourteen articles published in American journals, against twenty-one from journals published in Great Britain and her colonies; and our proportion would be even larger, did not some Americans still publish their observations in foreign journals.

But the feeling of inferior opportunity, of living in an unfavorable professional environment, is still unduly prevalent among us. These instances of an approaching balance of opportunities still need to be pointed out. Of course it is not hard to find instances where gross injustice has been done to American workers; but, as was stated in a previous editorial, we should not make the shortcomings of an individual the ground of prejudice against the whole profession of a country. Especially must we avoid this because it is an injustice that has been practiced against us.

The growing recognition of American work abroad is no cause for vainglory. But, in so far as the facts lend themselves naturally to the purpose, they may properly be used to develop a just self-respect on the part of the profession in America. Self-respect is a condition essential for our best work. As John Milton long ago observed: "The pious and just honoring of ourselves may be thought the radical moisture and fountain-head from whence every laudable and worthy enterprise issues forth." With the development of a healthy self-respect on the part of the American worker in ophthalmology, he will become more prolific and accurate in his work, and more original. He will grow less sensitive to neglect or unfavorable criticism, and he will enforce higher standards of scientific and ethical attainment upon himself and his fellows.

EDWARD JACKSON.

Electric Light Least Injurious to the Eyes.—An English journal named *The People* has the following item of news: "A Russian medical man has decided that the electric light is least injurious to the eyes. He says that the oftener the lids are closed the greater the fatigue and consequent injury. By experiments he finds that the lid would close with different illuminations per minute: Candle light, 6.8; gas, 2.8; sun, 2.2; electric light, 1.8.

TRANSLATION.

Action of Certain Toxines Upon the Cornea. *By Dr. Henry Coppez, Fellow of the University of Brussels. Arranged from the French by Ellet O. Sisson, M. D., Member Ninth International Ophthalmological Congress.* For a long time attention has been called to lesion of the cornea, due to toxine substances secreted by microbes. Leber has demonstrated that in abscesses of the cornea the toxines diffuse through the entire extent of the membrane leading the necrosis, where they are concentrated, and producing a dilatation of the vessels, and as the result an immigration of leucocytes.

In the present paper I intend to study summarily the action upon the cornea of toxines secreted, not by the microbes lying near the surface, or in the deep layers of the cornea, but by the micro-organisms in the conjunctival sac.

The question that presents itself is, Are the corneal lesions the immediate result of an infected conjunctival sac? In studying this question we should consider two things:

1. In what ways can the toxines secreted in the conjunctival sac act upon the cornea?

2. What is the special action of each toxine?

In What Ways Can the Toxines Secreted in the Conjunctival Sac Act Upon the Cornea? As to the first, let us take, as a type of disease, diphtheria of the conjunctiva. We know that diphtheria is a toxine affection, i. e., that the bacilli remain localized at the point of inoculation, secreting there the toxines that spread through the organism.

The false diphtheritic membranes have for their place of election the tarsal conjunctiva. A part of the toxine diffuses through the fibrinous exudation, and so passes into the general circulation; this toxine has no action upon the cornea. Addarió has recently demonstrated that if one injects a soluble salt under the conjunctiva, beginning at the cul de sac, no trace of it will be found in the anterior chamber, nor in the cornea.

Another portion of the diphtheritic toxine does not penetrate the false membrane, but spreads itself out, mixed with the tears upon the bulbar conjunctiva and surface of the cornea.

Can there be absorption at the surface of the bulbar conjunctiva and consecutive passage into the anterior chamber and cornea? We do not believe so. The inflamed conjunctiva absorbs with difficulty and the toxines, as the result of the large size of their molecules, traverse with difficulty the animal membranes (Gautier).

To resume, the toxines act above all upon the anterior surface of the cornea, much less upon the periphery through the medium of the lymphatics under the conjunctiva and still less upon the posterior surface, through the medium of the aqueous humor. It may well be asked, does not the lachrymal secretion possess an antitoxic power? Gosetti and Jona[2] have conducted some experiments along these lines with the Löffler bacillus. After having proven that the tears have no bactericidal power upon the bacillus, they attribute to them an antitoxic power; because in adding to a culture of diphtheritic bacilli in bouillion a certain quantity of tears, they have been able to delay, and even to prevent, the death of the innoculated guinea pig.

I have criticised the experiments of Gosetti and Jona, and in place of using the bacilli themselves, I have used their toxines. I have never been able to ascertain that the addition of tears to the diphtheritic toxine diminished the violence of the latter, either in its general effect, when injected sub-cutaneously into the guinea pig or locally into the eye of a rabbit by a sub-conjunctival injection. The lachrymal fluid has no direct action upon the diphtheritic toxine.

The layer of epithelium protects the corneal tissue against the destructive action of the toxine. This barrier is a very efficient one. If one raises some of this epithelium and then drops into the conjunctival sac some of the diphtheritic toxine (by preference diluted to the tenth), the cornea changes with great rapidity. If the epithelium is intact, the cornea is attacked with much more difficulty. This was proven by the experiments of Morax and Elmassian[3] with instillations of diphtheria toxine repeated every three minutes for about eight hours; it was not until the third day that appreciable lesions of the cornea appeared.

These considerations make it clear that diphtheritic conjunctivitis will be especially serious if the anterior surface of the cornea is denuded. Now, the corneal epithelium can change itself under the following circumstances:

1. By the action of the various medicines used in the treatment of the case. Too often it is the attempts awkwardly made to ascertain

the extent of the disease which irritates the epithelium and permits the infiltration and intoxication of the cornea. Profuse washing can produce the same result.

2. As the result of the presence of such anterior lesions of the cornea, as phlyctaenulae, superficial ulcers, recent opacities, etc. We know that, as a rule, conjunctival diphtheria follows some other ocular affection, most often a diseased state of the lymphatics of the eye.

3. The false membrane covering the tarsal surface of the lids graze the cornea, and there is permanent danger of scratching its surface.

4. The action of the toxine itself. Morax and Elmassian have demonstrated that the frequent instillations of diluted toxine break up after a certain time the conjunctival epithelium. In forty-eight hours, as previously stated, the cornea desquamates partially, and then the toxines are absorbed much more rapidly.

A therapeutic indication evolves from these data, i. e., that it is necessary in some way to protect the anterior surface of the cornea against the action of the toxine. The most simple method seems to me to consist in a frequent anointing of the conjunctival sac with vaseline.

What Is the Special Action of Each Toxine? 1. Diphtheritic toxine. It produces a desquamation of the corneal epithelium in the manner described, rendering it a prey to the destructive action of the various pyogenic bacteria.

2. Abrine. This vegetable toxalbumen, the active principle of the macerated jequirity bean, applied to the conjunctival sac, produces hyperæmia suppuration and finally the appearance of false membranes. The cornea may become opaque or it may necrose.

The therapeutic use of the abrine shows us, without doubt, that this toxine, no more than the diphtheritic toxine, acts upon the cornea by causing a thrombosis of the nutrient vessels of that membrane. If such was its action in those cases where a thick pannus covered the cornea, one ought to see the pannus disappear the moment the false membrane forms. Such is not the case. On the contrary, in place of arresting the circulation, the toxines dilate the vessels and thus increase it.

3. The streptococcic toxine. It is necessary for us to notice here an action much less than for the diphtheritic toxine and the abrine for the streptococci secrete toxines in a much less quantity than the bacilli of Löffler. The streptococci circulate themselves.

It was Bardelli[4] who conducted the first experiments, using both plate and dead cultures. By instilling these cultures into the conjunc-

tival sac three or four times a day he obtained in the third week a slow opacification of the cornea.

I have repeated with the cultures of streptococci the experiments which I began in 1897[5] with the diphtheritic toxine, using a bouillion culture, first killing the bacilli and then filtering. I injected the streptotoxine under the conjunctiva with a preliminary corneal lesion; I also instilled it into the conjunctival sac, and placed it in direct contact with the cornea during several hours by means of a specially constructed appliance. And I have never obtained at any time the least change incident to the action of the streptotoxine. If at times the cornea became covered with a slight film, the same effect was obtained with sterilized bouillion.

I have tried to injure the cornea when injecting the filtered streptotoxine into the anterior chamber by scratching the posterior epithelium. I have obtained, as the result, an irritation of the iris, followed by a temporary obliteration of the pupil by a clotted deposit in the anterior chamber, and a manifest trouble of the deep layers of the cornea along the margins of the scratches. But if one injects sterilized bouillion into the anterior chamber under similar circumstances one frequently sees the same phenomena displayed, only to a less degree.

If, in place of filtered cultures, one uses cultures of streptococci killed with toluol, one gets the same result. The reaction, however, is more intense. One even sees small abscesses form upon the iris. But if one injects into the anterior chamber sterilized bouillion to which has been added toluol, the resulting reaction is more intense than with the pure sterilized bouillion.

In summing up, it is quite difficult to say just what part of this reaction is due to the toxine, what to the cadavers of the streptococci, what to the toluol and what to the bouillion. It is in all cases very evident that the streptotoxine at least has much less action upon the cornea than the diphtheritic toxine or the abrine.

It results from this that from the point of view of local therapeutics it would be necessary to call for some antistreptoxic serum with bactericidal properties rather than antitoxic properties.

4. Toxine of pneumococci. All investigators who have interested themselves in the pneumococcus have verified the fact that the different media in which the microbe develops contain the toxic products of the bacteria (Denys[6]). This toxine does not appear endowed with

great energy; it cannot be compared with the diphtheritic toxine in this respect.

We know that the pneumococcus is very frequently found in suppurative ulcers of the cornea, and that one of the forms of mild conjunctivitis is caused by it, in rare instances being accompanied by corneal lesion.

Finally, in those cases of dacryocystitis in which the pneumococcus occurs, the pus charged with these microbes constantly bathes the corneal surface without causing the least damage. Not until traumatism of the cornea occurs, in some manner destroying the epithelium, do they attack it.

There seems to be a difference in the intensity of the action of the pneumococcus in corneal ulcers and conjunctivitis and dacryocystitis with corneal integrity. One can explain this difference by admitting with Druaut and Petit[7] a peculiar resistance possessed by the epithelial cells against the pneumotoxine, or by attributing to this latter a power which, although active, is limited to the parts where it is concentrated, i. e., to the immediate neighborhood of the microbic centers themselves.

I have repeated with cultures of the pneumococci the experiments conducted with the streptotoxine, and I have not obtained any very convincing results. Even prolonged contact of the filtered cultures with the previously ulcerated cornea did not produce any decided reaction. By these experiments I have been led to believe that there is not only a peculiar resistance on the part of the epithelial cells, but that there is want of energy in the toxine itself.

The injection of the toxine into the anterior chamber with grattage of the corneal epithelium produced the same effect as the injection of the streptotoxine. If one employs dead cultures, in place of filtered ones, the reactional phenomena is more intense, the same as in the case of the streptococci.

The conclusion to be drawn from these experiments is, that to obtain distinct lesions of the cornea the toxine does not suffice and that it is necessary to introduce the living microbes into the heart of the corneal tissue.

5. Toxines of the staphylococcus pyogenes aureus and albus. I have not made personal researches with the toxines of these bacteria. The staphylococci appear to me to play a minor and very obscure role in the pathology of the cornea. At St. Petersburg, Soloview and Molodorosky[8] claim to have found only a quantitative difference between

the microbes and their toxines, but it is, however, wise, before accepting these results, to dispose of the part played in the experiments by the accessory factors, i. e., the bouillion, the products added to kill the bacteria, etc.

Keokuk, Iowa.

BIBLIOGRAPHY.

1. Addario. Arch. f. Ophthalm. XLVIII, 2, p. 362.
2. Gosetti et Jona. Annali d. Ottalm. XXVII, 1-2.
3. Morax et Elmassian. Annales de l'Institut Pasteur, 1898, p. 210.
4. Bardelli. Annali d' Ottalm. XXV, 1.
5. H. Coppez. Bull. de la Soc. Franç., d. Ophtalm., 1897, p. 90.
6. Denys. Ann. Soc. Médico-Chirurgicale d'Anvers. Fevrier, 1897.
7. Druaut et Petit. Archives d'Ophtalmologie, Juillet, 1899.
8. Soloview et Molodorosky. Thèses de Doctorat de Saint Pétersbourg, 1897.

Preliminary plans for the new medical school buildings at Harvard University have been completed, and a site has been chosen in the lot of twenty-six acres in Brookline which was bought for the university last summer. According to these proposals, the school will be made up of three buildings facing on an oblong court. Each of the buildings along the sides will be a series of wings connected by corridors, and each wing will be devoted to some special department. On the southeastern side the four wings are devoted respectively to anatomy, histology and embryology, hygiene and pharmacology. The wings on the northwestern side are devoted to physiology, physiological chemistry, surgery and bacteriology and pathology. The building on the side between these two sides will be given up to the administrative department of the medical school. It is thought that these plans will require the expenditure of $2,000,000. Part of this sum can be realized by the sale of the present site, but as yet no other funds are forthcoming, and the beginning of the work will necessarily be delayed.

REPORTS OF SOCIETIES.

OPHTHALMOLOGICAL SOCIETY OF THE UNITED KINGDOM.

Clinical evening, May 2, 1901. C. Anderson Critchett, M. A., F. R. C. S. E., President, in the chair.

Double Pulsating Exophthalmos. Mr. Nettleship, for Dr. D. J. Wood, read notes of this case, which followed an injury to the head, and which was cured by ligature of the left common carotid. The exophthalmos developed gradually after a fall on the head; the artery was ligatured ten days after the accident. Pulsation and proptosis were permanently cured, though partial atrophy of the left optic nerve supervened.

Mr. Treacher Collins referred to a case of his own in which the injury was caused by a bullet, and which was greatly benefited by ligaturing the carotid.

Congenital Ptosis. Mr. C. W. Roll exhibited two cases in which he had performed Hess's operation with benefit. One case had been operated on three years before, and the cure was probably permanent, while the other was operated upon a year ago, but in this case it was bilateral.

The President cited five cases upon which he had operated, of which two were permanently successful, while the other three appeared to be drifting back again.

Sarcoma of the Orbit. Mr. Simeon Snell exhibited a sarcoma of the orbit removed from a miner, aged 38, in December last. It had been noticed for eight months, and was the size of a pigeon's egg. It was definitely encapsuled and was made up of large spindle-shaped cells.

Serous Iritis and Tachycardia. Dr. Rayner D. Batten showed two cases of this. One was a girl, aged 14, who had had severe serous iritis associated with tachycardia and thyroid enlargement, which had improved at one time and had then recurred. The second girl, aged 20, had well-marked serous iritis associated with tachycardia, enlarged heart, tremors and flushings, but no distinct enlargement of the thyroid.

The President mentioned other similar cases.

Choroiditis. Mr. Hartridge showed a case of choroiditis which had

been shown in an early stage at the December meeting. Although the changes were so extensive, yet the vision was now — in one eye and — in the other.

Periscopic Glasses. Mr. A. S. Percival showed a pair of periscopic glasses, the curve of which was so made as to prevent the distortion usually experienced with ordinary glasses when looking sideways.

Malformations. Mr. W. Lang showed an infant with a congenital notch in the outer part of the left lower lid and a dermoid growth on the eye.

Mr. Adams Frost showed a child with a variety of malformations about the face. There was a quadrilateral gap in the right upper eyelid, the lashes being absent, while above the eyebrow was a tuft resembling them. The caruncle was deformed. At the outer canthus there projected a mass resembling a lobe of the lachrymal gland. The development of the external ear was defective on the same side; although there was no meatus, yet hearing was not entirely absent. A dermoid structure existed near the right angle of the mouth, which projected on to the inner aspect, and there was a dimple on the left side, as if something had been removed. The eye was healthy; there was no coloboma of the choroid.

Mr. Johnson Taylor drew attention to depth at which the corneal dermoids are situated and the President recommended the use of a blunt-pointed knife for its removal.

Refractometer. Mr. C. Blair exhibited a portable refractometer which consisted of a spectacle frame carrying revolving discs fitted with glasses so arranged that an extensive range of lenses could be placed before each eye; thus time and trouble could be saved in retinoscopy.

Foreign Body in the Eye. Mr. J. B. Story showed a thorn which had been buried in the iris for two months. When discovered it was readily removed.

The President said he had removed a splinter of wood from the anterior chamber which had been present for twelve years.

Primary Chancre of Lid. Mr. C. Wray showed a case of primary chancre of the lower lid, which had been innoculated by the finger nail.

Detached Retina. Mr. Wray also showed a man who had had extensive detachment of the retina, with 15D of Myopia. The eye had been punctured twice by Wolff's operation and Hyd: cum Crete Gr. 2 thrice daily had been given. The retina had become reapplied and the vision was .... and was still improving.

Mr. Marcus Gunn said the operation had been done long before Wolff wrote about it, and it should not be associated with his name. There was still some detachment and choroiditis present in Mr. Wray's case. Mr. Johnson Taylor had performed the operation two or three times with bad results.

The President said his own experience had been disastrous. One case he had advised against operation had recently had it done abroad, and as the result the vision had fallen from J8 to J19.

Mr. Wray also showed a case of doubtful exostosis of the orbit with skiagraphs.

Spring Catarrh. Mr. Holmes Spicer showed a case of spring catarrh in a quiescent stage. The appearance was quite typical and she had had three attacks in South Africa each summer.

Mr. Lang referred to the great importance of recognizing this condition, as he had lately seen a case which had been treated by a plastic operation under the impression that it was trachoma, and here great damage resulted.

Double Temporal Hemianopsia. Mr. A. H. Thompson showed a case of double temporal hemianopsia, which occurred suddenly in association with the vomiting of pregnancy. There was optic neuritis and he thought that the lesion was anterior to the chiasma.

Thiersch Graft of Orbit. Mr. J. H. Fisher showed a good result from the use of a large graft from the arm after removal of the contents of the orbit. He mentioned three other cases which had given good results.

CHICAGO OPHTHALMOLOGICAL AND OTOLOGICAL SOCIETY.

A regular meeting was held April 9, 1901, with the President, Dr. Casey A. Wood, in the chair.

Dr. Albert E. Bulson, Jr., of Fort Wayne, Ind., presented a preliminary report upon the *Use of Adrenalin Solutions.* He said that several weeks ago he had, like many other members of the Society, received samples of Adrenalin solutions from a well-known pharmaceutical house, for experimental use. The Adrenalin used in the preparation of the solutions was said to be the pure active principle of the suprarenal gland. The solutions furnished for trial were in strengths of 1-10,000, 1-5000 and 1-1000, with .5 per cent chloretone added as a

preservative, and reported by the manufacturers as being sterile, unirritating, of uniform strength and fairly permanent.

These solutions were first tried in the nose, and it was at once discovered that a very decided blanching of the mucous membrane occurred after use of even the weakest solution. It was soon noted, however, that for general purposes the strongest solution (1-1000) was none too active, particularly if the solution was used with a view to performing bloodless operations of a minor character. This was also found true in using the solution in the eye. A 1-1000 solution blanched the eye in a very few seconds, and this effect lasted from thirty minutes to two hours. This effect was also secured in an eye affected with superficial inflammation, such as catarrhal conjunctivitis, and to a less extent in the deeper inflammations of the eye, such as iridocyclitis.

Dr. Bulson said that under the influence of a 1-1000 solution and cocain anesthesia he had performed tenotomies, advancements, and other operations upon the eye and its appendages, with but little, if any, loss of blood. In operations upon the conjunctival surfaces of the lids and the eye muscles, he finds that there is practically no hemorrhage if the strongest Adrenalin solution has been previously used, and in this respect the results compare equally with the results obtained from the freshly prepared solution of the desiccated gland. He finds that in intra-nasal operations the solutions work beautifully. In the removal of polypi the surrounding intumescent tissues are completely reduced, thus giving room for work and a clear view of the growth, as well as limiting, if not entirely preventing, hemorrhage. Nasal spurs, unless very large, are removed without hemorrhage of any consequence.

He has lately used the solutions in the treatment of middle-ear inflammations, but with rather indifferent success. In one case of mild acute catarrhal inflammation of the middle ear, accompanied by tinnitus, moderate impairment of hearing and pain, relief was obtained within a few minutes by applying the strongest Adrenalin solution to the post-nasal mucous membrane and the tympanum. In a case of pannus and acute exacerbation of a trachomatous inflammation the strongest solution has been used with apparently beneficial results. The reduction of the congestion is maintained by instillations of Adrenalin solutions every four or five hours, and this is supplemented by the other usual treatment prescribed in these cases. He believed that in acute congestive conditions of the ocular and palpebral conjunctiva it would

be possible to effect a cure by repeated instillations of Adrenalin solutions three or four hours apart.

Dr. Bulson said that the solutions have a tendency to deteriorate if exposed to light or air for any length of time, but that if ordinary care was observed the solutions would remain permanent and effective for a considerable length of time, and certainly for a sufficient length of time for the average operator to use the original package in which the solution comes. If there is any doubt as to the solutions being sterile, he would advise boiling them, as such treatment does not impair their efficacy.

Owing to the fact that the solutions are ready for use at all times, he thought they were very much better than the ordinary suprarenal gland solutions, and therefore a valuable accessory to the ophthalmologist's equipment.

Dr. Gradle said that he had used adrenalin chloride. He found the solutions to change in character in the course of time, darkening and losing in strength. He studied its effect on congested ocular surfaces, as well as its influence on the turgescence of the nasal mucosa, and in the control of hemorrhage in a small number of eye operations and a large number of nasal operations. He has not been able to satisfy himself that one to ten thousand solutions have any appreciable effect; one to five thousand has a distinct effect; one to one thousand is efficient, but not at all equal to a freshly prepared 10 per cent solution of the powder. He applied the one to ten thousand solution in a case of cyclitis, intense iritis, etc., and there was no appreciable effect on the circulation, whereas a 10 per cent solution of the freshly prepared powder, which was applied subsequently, blanched the tissues immediately. He believes the strength of the adrenalin solution to be decidedly inferior to the 10 per cent solution of the powder.

He has found that the addition of chloroform to the solution of the powder will preserve it. The addition of one per cent of chloroform will make the solution absolutely stable as far as putrefaction is concerned. It loses its color, however, and eventually deteriorates in strength. The difference between a solution one day old and another three or four days old is not appreciable; but the difference between a two-day-old solution and one two weeks old is very decided. He said that in cases of enlarged turbinal the operation can be performed with perfect ease and without any hemorrhage whatever if fresh solutions are used. Old solutions are always accompanied by some hemorrhage.

The addition of one per cent chloroform is not objectionable when the solutions are used in the nose. For the eye it is objectionable, but it can be easily driven off by heat. Dr. Gradle dips the swab into the solution and then holds it over a lamp until the chloroform is driven off. He says that of all the preservatives he has tried none has given him so much satisfaction as has chloroform. In Darier's clinic the suprarenal solution is used without the addition of any preservative. It is sterilized and then drawn up in capillary tubes, which are sealed. It does not spoil, but it deteriorates just the same.

Dr. Starkey has used the adrenalin solution in various eye cases and has been very much pleased with it. His experience in nose and throat cases has been so limited as not to warrant an opinion. He found the one to ten thousand solution is practically useless. In mild cases it produces blanching very quickly, but effect also passes away quickly. He has frequently used the one to five thousand solution on a case a number of times a day, and says he has never yet found it to produce any unpleasant effect; in fact, in most cases it has seemed to be decidedly efficacious. In subacute and chronic cases the effect produced lasts about four hours, and we have no such after-effect as is produced by cocaine. In many cases the congestion at the end of twelve hours will not be as great as it was before the solution was used. Dr. Starkey has found that adrenalin very decidedly modifies the course of cases of episcleritis. Within the last two or three weeks he has had under his care six or eight cases of this kind, and found that a few drops of the one to five thousand adrenalin solution produced in moderate cases a complete disappearance of all the blood-vessels, and they were very slow in returning to their former size. He has used the extract suprarenal gland for several years, but mainly only in operations, because of the difficulty of keeping the solution. He has kept the solution for weeks without much deterioration, but it has proven irritating, sometimes causing severe smarting. The adrenalin solutions certainly keep better than the solutions of the powder. The solutions which he has had in his office for two months have not changed color as yet.

Dr. Bulson, in closing the discussion, said that the change of color of the solutions was due to exposure to light and air. He has had one or two bottles of the solution in his desk for some weeks, tightly corked and away from the light, and they have not changed in color. He has noticed that there seems to be some difference in the effects

produced by fresh solutions, recently received from the factory, as compared with the effects produced by solutions received eight or nine weeks ago. He attributes this to the fact that the solutions which he had been using were being exposed to light and air through frequent opening of the bottle. Solutions kept in the dark and well corked remain perfectly fresh and efficacious for several weeks at least. He thought it advisable to have a stock bottle from which a small portion may be taken each day for regular use. There can be no objections to boiling the solutions if there is any doubt as to their being aseptic.

Like Dr. Gradle and Dr. Starkey, he discarded the use of the 1-10,000 solutions, as they are too mild. The 1-5000 solution blanches the conjunctival surfaces and the mucous membrane of the nose very nicely, but the 1-1000 solution does the work much more satisfactorily.

In reply to Dr. Gradle's point that the solutions do not affect the deeper congestions, nor entirely prevent hemorrhage in intranasal surgery, he would say that such has not been his experience. He said that about a week ago he enucleated a perforated eye in which there was marked iridocyclitis. The application of a 1-1000 adrenalin solution blanched the eye perfectly and simplified the operation considerably through prevention of hemorrhage. His operations upon septal spurs had been as bloodless with adrenalin solutions as with the ordinary suprarenal gland solutions, but if a more vaso-constricting effect is desired it can be obtained by an increase in the strength of the solution.

As to suprarenal solutions containing chloroform as a preservative, he thought he would have some hesitancy in using them on the conjunctival surfaces, unless some method was used to destroy the chloroform immediately before use. When used on a pledget of cotton, as a swab, the chloroform might be destroyed by holding the swab in the gas flame for a few seconds prior to use, as suggested by Dr. Gradle.

As adrenalin is non-irritating, non-toxic, and a very powerful heart stimulant, there seems to be no good reason why it cannot be used in a 1-500 solution, or even stronger. Further experience will probably indicate the use of a 1-500 solution as the standard for operative work.

Dr. Lawbaugh reported a case of *detachment and reattachment of the retina.*

Dr. Young reported a case which, when first seen by him, simply

showed a little flocculent cloud in the lower fundus. This later on increased in size and finally became a detachment. Under large doses of K. I., pilocarpin and rest in bed there has been some improvement. The area of detachment seems smaller than it was when first seen. The case is improving. She is taking 270 grains of K. I. daily and is nursing a child. The milk has not been affected by the medicine; the child is well. He was in doubt whether to ascribe the good result to the pilocarpin and the sweating it induced, or to the K. I.

Dr. Coleman reported a case of *sarcoma of choroid in a four-year-old child.*

Dr. Starkey presented a case of *pulsating exophthalmus.*

Dr. Wood presented a case of *eccentricity of the pupil.*

Dr. Pusey reported a case and exhibited microscopical specimens of *mucous degeneration of the conjunctiva.*

Dr. Young exhibited a new mastoid bandage.

A letter from India discloses the fact that the natives are becoming very myopic. The cause for this is probably found in the increasing studiousness of the people. Glasses are being worn in this country now much more frequently than formerly. Many of the schools are endorsing the eye and ear examinations by teachers and great satisfaction is reported therefrom. The various forms of conjunctivitis are still very frequent in this country and attain startling proportions.

Note on the Pathology of Toxic Amblyopias.—J. Herbert Parsons states that since 1880 it has been known that the papillo-macular bundles of the optic nerves are degenerated in cases of tobacco amblyopia. The paralyzing effect of nicotine is obtained whether it is injected into the circulation or whether applied to cells locally. The writer believes that the drug acts, not essentially upon the nerve cell, but upon the branchings (synapse) of the pre-ganglionic fibres around the cell. It is possible that there may be changes in the cell itself, but even the delicate Nissl method is not sufficiently delicate to show this. The action of nicotine may be reasonably supposed to be: (1) Vascular, causing vaso-constriction of the arterioles, which would explain the selection of the sparsely supplied macular region; (2) paralytic, upon the synapses either of the cone fibres, or of the inner granules, or of both.—*British Medical Journal.*

NEWS ITEMS.

Personals and items of interest should be sent to
Dr. Frank Allport, 92 State Street, Chicago.

Dr. J. D. Windell has located in Minot, S. D.

Dr. W. L. Gauthier, late of Montreal, has located in Stillwater, Minn.

Dr. J. M. Lyon, recently of Chicago, has located in Everett, Washington.

Dr. R. A. Reeve has been appointed dean of the medical faculty of Toronto University.

Drs. Würdemann and Black have moved their offices to 105 Grand avenue, Milwaukee, Wis.

Dr. Robert Lewis, Jr., has been appointed aural surgeon to the New York Eye and Ear Infirmary.

Dr. E. J. Gardner, of Chicago, Ill., has resigned from the Eye and Ear Department of St. Luke's Hospital.

Dr. Herman, of Redfield, S. D., is going to Europe for an extended special course of study. He will take up eye and ear work.

Dr. F. C. Todd, of Minneapolis, has been elected vice-president of the Hennepin County Medical Society, of Minneapolis.

Dr. Geo. C. Harlan has resigned from Attending Surgeonship at Wills' Hospital, Philadelphia, and Dr. S. Louis Ziegler has been elected on the staff. Dr. Ziegler is a graduate of the University of Pennsylvania, class of '85, and has been Assistant Surgeon to the Wills' Hospital for the past seven years.

One hundred and twenty-nine ophthalmologists registered at the last meeting of the American Medical Association at St. Paul.

Dr. Robert L. Randolph, of Baltimore, Md., has been made Associate Professor of Ophthalmology and Otology in Johns Hopkins University.

Dr. Frank Allport, of Chicago, was elected Chairman of the Ophthalmological Section, and Dr. C. A. Veasey secretary for the coming year.

American Academy of Medicine.—Dr. H. Burt Ellis, of Los Angeles, Cal., was elected secretary and treasurer of the American Academy of Medicine.

At the last meeting of the Indiana State Medical Society, held in South Bend, Ind., Dr. Albert E. Bulson, Jr., of Fort Wayne, was elected treasurer.

The St. Louis County Medical Society, of Duluth, Minn., held its annual meeting in Duluth, May 9th, and Dr. C. E. Lum, of that state, was elected treasurer.

At the annual election of the Ophthalmological Section of the New York Academy of Medicine, Dr. John E. Weeks was elected president and Dr. Henry H. Tyson, secretary.

Dr. Reik, of Baltimore, still consents to act as official reporter of the Ophthalmic Section, for which members of the section are extremely grateful.

Prof. Pagenstecky is about to retire from public work in his ophthalmic hospital, and will devote himself to private practice. He has had more royal patients than any other oculist.

At the American Medical Editors' Association to be held in St. Paul, June 3d, among the papers to be read is one by Dr. Dudley S. Reynolds, of Louisville, Ky., on "The Improvements in Medical Education."

The St. Luke's Hospital Bazaar, held in April, at St. Luke's Hospital, Chicago, netted about one thousand dollars to the charity fund of the hospital. It was engineered by the St. Luke's training School for nurses.

Dr. Glendon E. Curry has been appointed ophthalmologist to the West Penn Hospital, Pittsburg, Pa. Dr. Curry was also recently elected one of the ophthalmic surgeons to the Eye, Ear and Throat Hospital of Pittsburg.

We are informed that Dr. S. D. Risley, of Philadelphia, has not resigned from the Wills' Eye Hospital of that city, as we had supposed. He resigned from the Philadelphia Polyclinic instead, and was made Emeritus Professor of Ophthalmology.

The Bristol Eye Dispensary, of Bristol, England, had its annual meeting April 2d, under the presidency of P. J. Worsley. There were reported 1,776 patients treated, as against 1,762 last year. The finances were reported as entirely satisfactory.

Ophthalmological and Otological Society of Washington, D. C.—At the thirty-seventh annual meeting of this society, Dr. Stephen O. Richey was elected president; Dr. William H. Wilmer, vice-president, and Dr. Anton Coe, secretary and treasurer.

The Ophthalmic Record held its annual lunch at the Minnesota Club, Wednesday, June 5th. There were present Drs. Wood, Woodruff, Veasey, Würdemann, Savage, Jackson, Black, Hubbell, Fulton and Allport.

The Record was reported to be in a healthy condition, and Dr. Ellett, of Memphis, was added to the staff.

Dr. Geo. F. Suker has removed from Toledo, Ohio, to Chicago, and has opened an office at 100 State street.

He has received the appointment of Clinical Professor of Ophthalmology in the Chicago Post Graduate School and Clinical Instructor of Ophthalmology in the College of Physicians and Surgeons.

He has been conducting some experiments in the formation of a substantial stump after eyeball removal, by the injection of agar-agar.

The class of 1881 of the Medical Department of the University of Pennsylvania held a dinner June 12th, to commemorate the twentieth anniversary of its graduation. Amongst the committee to take charge of the affair we notice the name of Dr. George E. de Schweinitz.

Dr. Chas. M. Robertson has resigned from the College of Medicine of the University of Iowa, and Dr. Lee W. Dean, of Iowa City, has been appointed to his chair. Dr. Robertson has given up the practice of ophthalmology, and will hereafter confine himself to ear, nose and throat work, with his office in the Reliance Building, Chicago, Ill.

The banquet of the Ophthalmological Section was held at the Minnesota Club, and was perhaps the best banquet ever held for this purpose. Wine was served, and it certainly added to the pleasure of the occasion. Dr. Cornelius Williams, of St. Paul, deserves the thanks of the Section for the successful manner in which he carried through the banquet arrangements. Dr. Lippincott, of Pittsburg, gracefully officiated as toastmaster, and called upon Drs. Wurdemann, Veasey, Woodruff, Ellett, Appleby, Thomson, Chamberlain, Allport and others to respond to toasts.

Ocular Complications of Smallpox.—The physicians of Lyons, France, observed serious ocular complications in an epidemic of 800 cases of smallpox last year, two patients becoming blind. They finally found that instillation of a 2 per 1000 solution of methylene blue, several times a day, at the slightest suspicion of disturbance in the eye, was as effective a prophylactic measure as nitrate of silver in ophthalmia neonatorum. In serious cases they made subconjunctival injections. Dufour recently cured a severe case by subconjunctival injection of a solution of bichlorid of mercury.

The Western Ophthalmologic and Oto Laryngologic Association, at its sixth annual meeting, held in Cincinnati, April 11th and 12th, elected the following officers: Dr. C. R. Holmes, Cincinnati, O., president; Dr. W. L. Dayton, Lincoln, Neb., first vice-president; Dr. J. O. Stillson, Indianapolis, Ind., second vice-president; Dr. H. W. Loeb, St. Louis, Mo., third vice-president; Dr. O. J. Stein, 100 State street, Chicago, treasurer; Dr. William L. Ballenger, 100 State street, Chicago, secretary. Forty new members were elected. The next meeting will be held in Chicago, April 10, 11 and 12, 1902.

Spectacles for Animals.—Horses may wear them, but hardly to aid the vision.

In response to an inquiry an optician said that he had never known, himself, of any animals wearing spectacles, but he had read of a horse in London that had been provided with a pair of spectacles, which, the account said, "the horse seemed to find delight in wearing." He had no reason to doubt that this was a true story, though certainly the statement that the horse seemed to find delight in wearing the spectacles did seem a little florid.

As a general proposition the fitting of any sort of spectacles to the eyes of any wearer would require the exercise of intelligence on the part of the wearer, as an aid to the fitting. Intelligent assistance would be given the human animal, man. But this could not be expected of horses and dogs.

Some defects of vision in their eyes might be determined without the aid of the subject examined, but intelligent co-operation in the fitting could not be had in their case, even if it were desirable for them to wear spectacles, or practicable for them to do so. At any rate, he had never himself known of an animal that did wear spectacles or of spectacles being made for animals.

A veterinary surgeon said he had never heard of a horse's wearing spectacles, though it would not be impossible to provide them, if that were desirable.

Horses sometimes wear over the eyes blinders with colored glasses. These are intended to prevent the horse from discerning shadows. Such blinders are sometimes put on trotting horses in races.

There are trotters that shy or break at the shadow on the track of the wire over it marking the starting and finishing point, or at the shadow of a building or of some projecting point of one, just as they would at a pool of water or some actual object on the track. A skip or a break might mean enough distance lost to lose the race. These blinders are used so that the horse won't see the shadows.

Some thoroughbred horses shy at mud or sand thrown in their eyes by horses ahead of them, and for these there are sometimes provided what are in effect spectacles, blinders covering the eyes for their protection, but having glasses of ordinary glass.

Horses and dogs were sometimes provided with glass eyes to improve their appearance.—*New York Sun.*

THE CHICAGO MILWAUKEE AND ST. PAUL RAILWAY

IS

The Best Line

TO

ST. PAUL AND MINNEAPOLIS.

THE ROUTE OF

The Pioneer Limited

The Only Perfect Train.
Leaving Chicago every day
at 6:30 p. m.

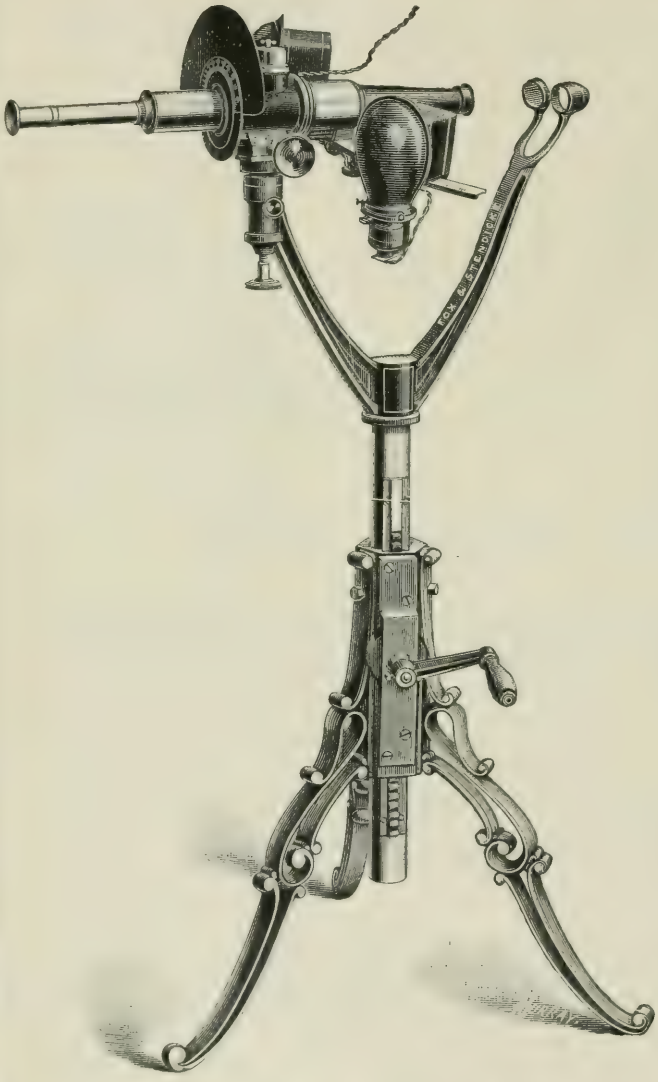
OTHER THROUGH TRAINS LEAVE CHICAGO FOR ST. PAUL AND MINNEAPOLIS AT 3.00 A. M., 9.00 A. M., 9.55 P. M. ALL DAILY.

CITY TICKET OFFICE,
95 ADAMS STREET.

UNION PASSENGER STATION,
MADISON ADAMS AND CANAL STREETS.

F. A. MILLER,
GEN'L PASSENGER AGENT, CHICAGO

THIS OPHTHALMOMETER



IS

1. Simultaneously adjusted to height of both patient and observer.

⚜

2. Has a frontal rest for patient which is automatic.

⚜

3. Has self-luminary targets.

⚜

4. Has focusing adjustment directly under telescope.

⚜

5. Is as compact as a dictionary holder and stand.

⚜

Many so called adjustments, movements, and so forth, are avoided.

Fox & Stendicke

61 Fulton St, NEW YORK.

Catalogue on Application.

Ophthalmometers from $40.00.

IF YOU INTEND

Taking out any Post-Graduate Course in Chicago, be sure and first communicate with the publisher of the

OPHTHALMIC RECORD.

The High Building, - - CHICAGO.

A GROWING number of oculists subscribe to The Optical Journal for the purpose of keeping informed as to the latest inventions of opticians, and the methods of the best refractionists.

The Optical Journal

is the only paper devoted exclusively and entirely to optics and the optical trade.

One Dollar a Year.
10 Cents a Copy.

Published once a month by

FREDERICK BOGER,
36 Maiden Lane, New York City.

Challen's Indexed Registers,

ON DIRECTORY AND VOWEL PLAN. RULED COLUMNS. PRINTED HEADINGS.

For any Business or Department of Business or Profession, to Quickly Enter Data with little writing, and Check Correct Entry or outmark if not, and claim reduction in bill rendered.

150 NASSAU STREET,
Room 1336.
NEW YORK.

PAN-AMERICAN EXPOSITION.

You are invited to call at our exhibit of Ophthalmological and Electro-Medical Apparatus in the Liberal Arts Building at the Pan-American Exposition, at Buffalo.

Special features of our exhibit are *Haab's Giant Magnet*, *Sectional Models* showing the mechanical and optical construction of the *Skeel Perimeter* and the *Meyrowitz Model Javal-Schiötz Ophthalmometer*, also the detailed process of the grinding of lenses and the manufacture of *Eye Glasses* and *Spectacles* from the rough material to the finished product.

E. B. MEYROWITZ,

Manufacturer of Ophthalmometers, Perimeters, Phorometers Tropometers, Refractometers, Ophthalmoscopes, Skiascopes, X-Ray Apparatus, Etc.

SEND FOR ILLUSTRATED CATALOGUE.

104 EAST 23rd STREET,
125 WEST 42nd STREET, } NEW YORK.
650 MADISON AVENUE,

604 NICOLLET AVENUE, MINNEAPOLIS.
360 ST. PETER STREET, ST. PAUL.
3 RUE SCRIBE, PARIS, FRANCE.

THE

Post-Graduate Medical School

OF CHICAGO

W. FRANKLIN COLEMAN, M. D., Prest.
W. L. BAUM, M. D., Treas

A. H. FERGUSON, M. D., Vice-Prest.
A. R. ELLIOTT, M. D.

Is now located in its new building,

2400 Dearborn Street

A school for practitioners of Medicine and Surgery.

Teaching exclusively Clinical.

Abundance of material.

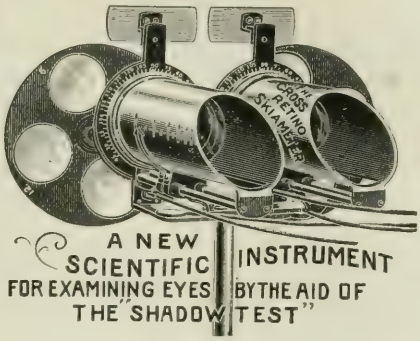
Large hospital in School Building.

Send for latest Bulletin of information to

FRANKLIN H. MARTIN, M. D., Secy, 2400 Dearborn St.

The Cross Retino-Skiameter.

"STATIC" TESTS.



"DYNAMIC" TESTS.

Manufactured by

THE A. JAY CROSS OPTICAL CO., 20 East 23rd St., New York.

Makers of High Grade "Shadow-Test" Specialties.

WRITE FOR CIRCULARS.

...Chicago Eye, Ear, Nose and Throat College...

A Post-Graduate School for Practitioners of Medicine.

Located in its own building two blocks from Court-house. Large hospital in building for Eye and Ear cases only. Abundant clinical material. Courses one month. Enter any time. Teaching clinical

A FREE CLINIC is conducted for the worthy poor only. Physicians are invited to send us their *Charity* cases. Write for catalogue and information to

W. A. FISHER, M. D. Pres. — **J. R. HOFFMAN, M. D. Sec'y,**

A. G. WIPPERN, M .D. Vice-Pres. — 206 E. Washington St., S. E. Cor. Franklin St.

FACULTY

WILLIAM A. FISHER, M. D.
JOHN R. HOFFMAN, M. D.
HORACE M. STARKEY, M. D.
THOMAS FAITH, M. D.
JOHN F. OAKS, M. D.
A. G. WIPPERN, M. D.
W. H. PECK, M. D.
E. S. ANTISDALE, B. S. M. D.
JOSEPH C. BECK, M. D.
A. KENNEDY MCLEAN, M. D. M. D.
WILLIAM A. MANN, M. D.
H. W. WOODRUFF, M. D.
W. L. BALLENGER, M. D.
N. C. KEMP, M. D.
EDWIN PYNCHON, M. D.

DOCTOR! Do you treat diseases of the **NOSE, THROAT** and **EAR?** If so you cannot afford to be without

THE LARYNGOSCOPE

The Representative Journal of Record of Oto-Laryngology

Note its many claims for special recognition:—

It is the only *regular* Monthly Journal *exclusively* devoted to the diseases of the *Nose, Throat and Ear.*

It is the *Official Organ* of three of our *Representative Oto Laryngologic Societies.*

It will keep you informed of the *progress of the world* in this trio of specialties.

It contains more *original matter* than any journal published representing these specialties.

It always enjoys the *contributions* and *endorsements* of the *best and ablest writers* in the profession.

It is managed by a *live Editorial Staff*, and free from the influence of any clique or society

Its subscription price places it within the reach of all, **Only $3.00 per annum, in advance**

We offer the Laryngoscope and the Ophthalmic Record to new subscribers for $6.00 per annum

Address THE LARYNGOSCOPE, 3858 Westminster Place, ST. LOUIS, MO.

OWING to numerous inquiries for the 1897 volume, as well as for odd numbers of the OPHTHALMIC RECORD we announce the following: Volumes I to V may be had by ordering of us direct. The price of each of these volumes is $4.00; single numbers, as long as they last, 35 cents each. Of volume VI the price of single numbers, as long as they last, will be 50 cents each. The full volume, $5.00. Very few of the complete sets are left. The January and April numbers are out of print. Single numbers of 1898 volume, 50 cents. Complete volume, $5.00. Single numbers, 1899 volume, 50 cents. Complete volume, $5.00. Single number of 1900, 50 cents. Complete volume $5.00. Single numbers of 1901, 50 cents. Carriage on any of the above prepaid to addresses in United States and Canada . . . Address the

OPHTHALMIC RECORD

. . The High Building . . Chicago. . .

FOR SALE CHEAP.

1 De Zeng' Corneal Microscope With Head Rest.

1 Ophthalmometer, 1900 Model.

ADDRESS: **PUBLISHER OPHTHALMIC RECORD.**

Annals of Ophthalmology

The largest illustrated Quarterly Eye Journal published. Each issue over 200 pages of original matter and properly drawn up abstracts of recent Domestic and Foreign Ophthalmic Literature.

Subscription price, $4.00 per annum.

Annals of Otology, Rhinology and Laryngology

Each issue over 150 pages original matter and properly drawn abstracts of recent Domestic and Foreign Literature.

BOTH JOURNALS, $5.00 *Subscription price, $3.00 per annum.*

We will furnish the **Annals of Ophthalmology** and the **Ophthalmic Record** for **$7** per annum; the **Annals of Ophthalmology** and the **Annals of Otology** and the **Ophthalmic Record** for **$8** per annum in advance to new subscribers.

ADDRESS

JONES H. PARKER, Publisher.

302 North Third Street. **ST. LOUIS, MO.**

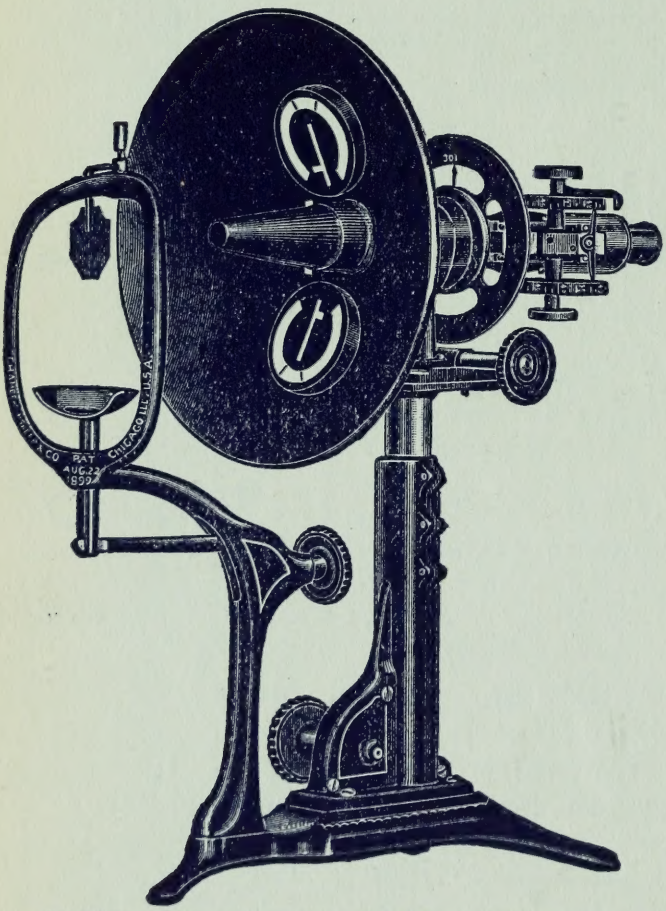
When writing, pleae mention the Ophthalmic Record.

Buy the Best Ophthalmometer in the World.

....The Paris....

Prize Winner

Price $80.00 3 months time;
or
$75.00 Net Cash.



Its Special Features are

ACCURACY

UNIFORMITY OF ILLUMINATION

EASE OF OPERATION

PERFECT MECHANICAL CONSTRUCTION.

Write for Full Descriptive Pamphlet.

CHAMBERS INSKEEP & CO.,

Manufacturers OPTICAL GOODS and EYE, EAR, NOSE and THROAT SURGICAL INSTRUMENTS.

88 and 90 Wabash Ave. ***Chicago, Ill.***